THE
IMMORTAL TAJ MAHAL

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The Evolution of the Tomb in Mughal Architecture

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A study of the evolution of the Mughal tomb in India and its perfection at the Taj Mahal, being part of the thesis approved for the degree of Ph.D. by the Agra University in 1969.

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TO THE MEMORY OF

My Revered Father

Sri Kapoorchand Durriwaley

Preface

THE present volume originally formed part of my thesis entitled 'Some Important Aspects of Mughal Architecture' (with special reference to the Monuments of Agra) approved for the Degree of Ph.D. by the Agra University in 1969. This is a study of the evolution of tomb in India and its perfection in the Taj Mahal. Though the genesis of man's aspirations to perpetuate the memory of a departed soul through architectural works has been traced in a remote past, in essence it deals with the funereal structures of the Mughal Age, chiefly that wonder-structure of art and architecture which is known under the simple name of the Taj.

The Mughal sepulchres from the tomb of Humayun at Delhi (A.D. 1565) to the Taj Mahal at Agra (A.D. 1631-48) have been examined in the historical perspective with reference to the inspirations, constructional and ornamental, which they derived from various sources. Particular attention has been devoted to evaluate the contribution of the indigenous norms of art and architecture towards the formation of body-fabric of the Mughal tomb. The point has generally been ignored and, decisive as it is in many cases, it warrants primary contemplation. We see the Kandariya Mahadeva temple at Khajuraho and we also study the *Vastu*-texts (treatises on architecture) of the Hindus, prescribing principles of construction and ornamentation which brought about its form. It is surprising that while we see the Taj Mahal, we meet with no *Vastu*-text of the Mughals, prescribing a code of the principles of building, or any other work on the subject which can be said to have led the Mughals to raise such a well-balanced and majestic structure!

It is not possible that the Mughals could have built such beautiful buildings without certain well-tried, set rules and norms. I have tried here to extricate these rules and norms from near obscurity and to distinguish between fact and fiction which has so unscrupulously been mixed up with the History of the Mughal monuments. Many unknown features regarding the Mughal tomb, e.g.,

the tomb of Akbar and the Taj Mahal, have come to light. Controversies have been examined in the minutest detail and an attempt has been made to establish the maximum historical truth in each case. Some new features of great interest and importance have been added to the study.

However, I do not claim to have said the last word on the subject; the most I can claim is to have opened up a new channel into which the scholars, now and in future, would find their inquisiteness flowing with profit. The study of history, as of any other science, is a continuous growth, an accretion and an unending process to which fresh facts and figures continuously add. My contribution to this study is a modest instalment, not the total sum.

I express my gratitude to my teacher Prof. G. L. Mukerji for his fatherly affection and learned guidance in pursuance of the study of Mughal architecture. I am deeply indebted to my friend Pandit M. K. Saraswat for his affectionate help, learned guidance and very valuable suggestions. He is a great source of inspiration and encouragement. I thank Sri B.S. Tiwari, Prof. R.P. Shukla, Professor & Head of the Department of Drawing and Painting, Agra College, Dr. N.S. Chauhan, Professor & Head of the Department of Psychology, Agra College, Sri T.R. Suyal, Sri G.A. Qamar and Sri P.D. Jhamb of the Archaeological Survey of India, Sri S.M. Tripathi, Librarian, Central Library, Agra College, for their kind help and whole-hearted co-operation.

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I am obliged to my friend Sri Ayaz Ahmed for his constant help, particularly in the collection of the illustrative data for this book. He has stood with me in all thicks and thins and his friendship is the most reliable asset to me for the last twenty years. My thanks are also due to Sri Raj Bahadur, Sri Ved Prakash, Sri Satyaprakash and Sri Lokesh of Messrs. Priyalal and Sons, Photographers and Sri K.K. Gupta for assistance in photographic work and typing respectively.

This book is respectfully dedicated to the memory of my late father in token of the irrepayable debt I owe to him.

I must also acknowledge gratitude to my wife who has shared the difficult moments of a hard life without grumble. Without her devotion and wholesale sacrifice of all her personal desires and ambitions, the harsh realities of this life would have drowned me to the fathomless bottom. I know this selfless devotion is spontaneous and part and parcel of her life and hardly needs any recognition. Without her co-operation, however, I must inscribe, this difficult work could not have been undertaken and pursued.

Finally, I thank D.B. Taraporevala Sons & Co. Private Ltd., for their kindly publishing this research work and presenting it so impressively.

105, Nehrunagar
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September 30, 1972

—R. NATH

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Introduction

THE MOST lamentable aspect of Mughal history is the neglect of its monuments by contemporary chroniclers. Even the detailed and accurate accounts of Babur lack an actual description of the architectural projects at Agra upon which he recorded to have employed 489 stone-cutters. Historians of the glorious age of Akbar, e.g., Nizamuddin, Abul Fazl and Badaoni, suffer from the same defect. They devoted attention chiefly to the Royal marches, ceremonies and functions, wars and conquests, promotions, and sometimes religious discourses. The reference to monuments is regrettably casual. Abul Fazl mentions upwards of 500 buildings which Akbar constructed in the fort at Agra but has taken no pains to describe a single one! Even the magnificent Delhi Gate of this fort has not been mentioned by him. Beautiful palaces and administrative buildings were constructed at Fatehpur Sikri before their eyes, but they have made no mention of the so-called Birbal's Palace, Abul Fazl's Palace, Jodhbai's Palace or the controversial Diwan-i-Khas. They have not described even the tomb of Sheikh Salim Chishti. The Ibadat-Khana is still a mystery and in spite of so many suggestions it has not yet been traced. Curiously, Badaoni used to enjoy the privilege of spending there hours together. Jehangir has made a mention of the palace he built near the ramparts in the fort of Agra. But his references to his father's tomb at Sikandara near Agra, built between A.D. 1605 and 1612 are meagre and give no idea as to its exact planning or design. He even does not allude to the provision of a secret cenotaph—besides the lowermost grave and the uppermost sarcophagus—which was built ingeniously within the body of the fourth storey, unseen and unknown to the outside world. No contemporary record of any practical value exists regarding the tomb of Itmad-ud-Daulah. The Kanch Mahal has not even been mentioned. Abdul Hamid Lahauri, the court historian of Shah Jehan, was the first to take up the subject; he described at length the buildings of his patron in the forts of Agra and Delhi. But his accounts are vague, without any order or arrangement, and lack a critical study of the prevalent architectural style. They are full of eulogical commendations, so much so that almost every palace of his description was loaded with gold and glittered more

glaringly than the sun and the moon and rose higher than the sky itself! Their exact sites at the same time cannot be located.

Building activity in the Mughal age, it appears, was a common feature and unless there was something unique which could evoke the medieval sense of curiosity, it failed to move the contemporary historian, who was generally not inclined to include architectural subjects in his precious accounts. For him other Royal affairs of a political, military and ceremonial nature were of greater importance and hence occupied his whole attention.

The foreign travellers who happened to be in India in the 16th and the 17th centuries have added some valuable information to these accounts. But they had their own limitations. They had no access to the monuments until some powerful noble chose to patronise them. They mixed with the people at large, and though they had no intention to suppress or to exaggerate, they were easily susceptible to rumours and hearsay. Their own business and pursuits often sometimes led them to ignore the monuments. Father Monserrate does not give the necessary details of the Ibadat-Khana or the Diwan-i-Khas at Fatehpur Sikri. Hawkins is likewise deficient in his accounts of Akbar's tomb. Thomas Roe was several times with Jehangir in the Hammam-i-Shahi or the 'Ghusal-Khana' but has never mentioned how the air-conditioning system was operated. Peter Mundy's description of the wonderful buildings of Agra is equally meagre and insufficient. Tavernier personally weighed the diamonds of Shah Jehan but does not mention the secret apartments where the Treasury was located, or the Shish Mahal or other palatial mansions in the Agra Fort. Francis Bernier who was attached to the Court as a physician had access to the harem at times, but he does not describe the palaces.

All this has resulted in widespread misconceptions, and at times, gross misrepresentation of the Mughal monuments. As for example, the so-called Palace of Jodhbai was not built for Jodhbai, the queen of Jehangir, who later became the mother of Shah Jehan;[1] the so-called Birbal's Palace was not built by Birbal; the Diwan-i-Khas could never have been used as the Hall of Private Audience, as it is generally understood.[2] The Amarsingh Gate of Agra Fort was originally known as Akbar Darwaza[3] and was renamed as such after A.D. 1644 when Amar Singh Rathor, the elder brother of Raja Jaswantsingh of Jodhpur, assassinated Mir Bakhshi Salabat Khan and was himself killed in the fierce battle which was fought, as it is likely, near this gate.[4] The so-called Jehangiri Mahal was originally the Palace of Ibrahim Lodi which was adopted and converted by Akbar for his own purpose. The Mughal 'Ghusal-Khana' was not a bathroom but the institution of the innermost, closely guarded, private council-house of the Emperor.[5] The Chini-ka-Rauza has nothing Chinese in its form nor material; it is on the other hand one of the most brilliant examples of glazed-tile decoration, the origin of which can systematically be traced to ancient Mesopotamia.[6] The Shish Mahal likewise is the most glaring specimen in India of the interior

1. For identification of 'Jodhbai' see author's paper, 'Mausoleum of Mariam Zamani at Agra,' *Quarterly Review of Historical Studies*, Calcutta, Vol. X, 2, 1970-71.
2. See author's paper 'Genesis of the Diwan-i-Khas at Fatehpur Sikri,' *Indica*, Vol. V, No. 1, March 1968.
3. William Finch has casually made a mention of this gate as 'Acabar Drowage'. Cf. William Foster, *Early Travels in India* (London, 1921), p. 183.
4. Abdul Hamid Lahauri, *Badshah-nama*, Vol. II (Bib. Ind., Calcutta, 1868), pp. 380-84; James Tod, *Annals and Antiquities of Rajasthan*, Vol. II (London, 1920), p. 977; his observation that it was originally called 'Bokhara-Gate' (cf. ibid., p. 978) is not acceptable; Pt. Bisheshwar Nath Reu, *Glories of Marwar and the Glorious Rathors* (Jodhpur, 1943), pp. 83-84; B. P. Saksena, *History of Shah Jehan of Delhi*, pp. 316-17.
5. See author's paper 'Mughal Hammam and the Institution of Ghusal Khana,' *Islamic Culture*, Hyderabad, Vol. XLIV, No. 2 (April, 1970).
6. See author's monograph *Colour Decoration in Mughal Architecture* (Bombay, 1970), pp. 5-22.

ornamentation of glass-mosaic that the Romans and then the Byzantines employed on a large scale.

This unhistorical popular nomenclature of the monuments owes a lot to the over zealous, over confident, illiterate guides who coin such legendary associations and spread stories which work wonders on the sense of curiosity and romance of visitors. Their stories, which belong more to the art of fiction than to the science of history, gradually settle and become established.[7] This is how a considerable part of the history of Mughal architecture has been framed up!

Right since Thornton's Gazetteer of the East India Company, which was published in London in 1854, the British were anxious to record the monuments. Thanks to James Fergusson's pioneer efforts and Alexander Cunningham's most enlightened Director Generalship of the Archaeological Survey of India, a preliminary study of the Mughal monuments was taken in hand. A.C.L. Carlleyle made a detailed survey, collected the traditional stories, screened the legends and tried to provide a true history of Mughal architecture. H.H. Cole, H.G. Keene, E.B. Havell, and others followed in his footsteps. E. T. Atkinson and F. H. Fisher edited the accounts of Agra and its monuments in volume VII of *Statistical, Descriptive and Historical Account of Northern Western Provinces of India*, published at Allahabad in 1884. H. R. Nevill compiled the available information in his *Agra: A Gazetteer* in 1905. E. W. Smith took up the task of making a detailed survey of the buildings of Fatehpur Sikri, Akbar's tomb, and Chini-ka-Rauza. He expended a great amount of labour and collected invaluable plans, diagrams, plates and other illustrative material. The work was further pursued under the Director-Generalship of Sir John Marshall and the Viceroyalty of Curzon, which is however more noted for restoration and conservation of the monuments than their correct interpretation from the historical point of view. Some Muslim scholars also shared the study and the names of Syed Muhammad Latif, Moinuddin and Asharaf Husain may be mentioned in particular.

But, except for Fergusson and Havell, one and all described the monuments in a stereotype manner; they either neglected the historical part or accepted the popular misconceived notions. They did not interpret the architectural style with reference to the structural and decorative details; they ignored the inspiration which had brought about these forms. No attempt was made to trace the historical background or the evolutionary process with respect to the phenomena which gave this architecture its distinctive character. Fergusson and Havell have no doubt discussed some fundamentals as far as it was possible to do so in the second half of the 19th century and the first quarter of the 20th century. As art-critics they laid the foundation but failed to rebuild the history of these monuments or to correct the misconceptions. Even in their capacity as pioneer scholars of architecture, they had their own drawbacks: while Fergusson was too occidental in his approach, Havell maintained too oriental an outlook!

Percy Brown tried to maintain an impartial attitude but he had too vast a field for study—he took up the architectural styles of the whole of India from the earliest time to the modern day. An intensive study of this particular school of architecture was out of question, and he, therefore, could not do justice to it. He did not deal with scores of representative buildings like the tomb of Firoz Khan, the tomb of Mariam Zamani, Kanch Mahal, Chini-ka-Rauza, Shish Mahal and others. Out of the seventy-six intact monuments at Agra, he dealt only with the Agra Fort and some of its palaces,

7. J. Burton Page (cf. *Splendours of the East*, p. 144) rightly commented on this aspect: 'Many of the buildings are now known by names which are entirely arbitrary and have no justification beyond the usage of the local guides.'

and the Moti Masjid, Akbar's tomb, the tomb of Itmad-ud-Daulah, the Taj Mahal and the Jami Masjid. He did not make any mention of the very important Mughal institution of Hammam or Phansighar. He dealt with only the masterpieces of Mughal architecture and there too his accounts are often sketchy. He did not challenge the fictitious stories, e.g., the one that Shah Jehan intended to build a second Taj on the other bank of the Jamuna. With very limited time and space at his disposal, he did not aim to build a systematic history of Mughal architecture but deal only with its highlights.

These scholars are not to be blamed. Their labours are not to be underrated, nor should their foundational work be misjudged. So much of hearsay and romance had been mixed with the history of these monuments that it was not easy to winnow it all out. Unless a long-drawn, persistent and a thoroughly detailed special study of their architectural style in each individual case could be made on the basis of the historical background and the evolution of each structural and ornamental aspect, such attempts are not likely to bear fruit either. If the documentary or inscriptional evidence is not forthcoming or is not reliable, the legendary version only makes a mess of the whole thing; only a systematic and detailed study of its style can help us to extract the maximum truth to write a genuine history of Mughal architecture.

Unfortunately, the study of architectural monuments as a branch of history has generally been neglected in modern India. Its value as the most perfect manifestation of cultural pursuits of the past has rarely been realized. It may be due to some cumbersome technicalities which are inevitably involved in the study of this aspect of history. Scholars study with interest the fierce battles which Babur fought at Panipat and Khanwa but remain unconcerned with his Bagh Gul-i-Afshan (presently known as Rambagh) at Agra where he introduced the Char-bagh plan, the terraced garden and the artificial arrangement of running water through channels, water-chutes and lily-ponds.

No doubt the language of stone is difficult to decipher but once understood, it may prove one of the most authentic sources of history. Monuments—the architectural projects of the past—preserve the most faithful record of contemporary society; of the faith and beliefs, the aesthetic outlook and art capabilities of the contemporary people. As Morgan defines it, 'Architecture is the printing press of all ages and gives a history of the state of Society in which it was erected.' The chronicles which are written in the stones of constructed structures provide a key to the habits, thoughts and aspirations of the people who brought them to form. 'The study of architecture opens up the enjoyment of contemplating buildings with an appreciation of their purpose, meaning and charm and every structure conjures up the conditions of past ages. It is the one art with which we are all brought into daily contact, for it shelters us from the elements, gives us "Home" and enshrines the sacred symbols of all religions.... Architecture is the mother of the arts of Sculpture, Painting and the allied Decorative Crafts.... The History of Architecture is a record of continuous evolution....Architecture, striding down the ages, was evolved, moulded and adopted to meet the changing needs of nations in their religious, political and domestic development. A glance along the perspective of past ages reveals architecture as a lithic history of social conditions, progress, and religion and events which are land-marks in the history of mankind; for as architecture is in all periods intimately connected with national life the genius of a nation is unmistakably stamped on its architectural monuments...throughout the history of the human race architecture, the mother of all arts, has supplied shrines for

religion, homes for the living and monuments for the dead."[8]

Fergusson was fully conscious of the nature of his work and largely relied on the definitions and interpretations which could be deduced from a study of the historical stones. He observed, 'Some men of great eminence and learning, more conversant with books than buildings have naturally drawn their knowledge and inferences from written authorities, none of which are contemporaneous with the events they relate and all of which have been avowedly altered and falsified in later times. My authorities on the contrary have been mainly the imperishable records in the rocks or on sculptures and carvings which necessarily represented at the time the faith and feelings of those who executed them, and which retain their original impress to this day. In such a country as India, the chisels of her sculptors are, so far as I can judge, immeasurably more to be trusted than the pens of her authors."[9]

De Gustave le Bon, the eminent French archaeologist, thought along identical lines: 'We talk with reason when we say that nothing is more clearly written than what is written in stone; the History of India is traced as clearly as possible upon its monuments. These last unfortunately are disappearing with regrettable rapidity."[10] A proper study of these monuments would no doubt add substantially to the information scholars are already in possession of, and would fill in a certain miserable vacuum. The spirit of the Mughal age is most faithfully reflected in their monuments and their study will give insight into the tastes and temperaments of their builders. A free use of the typically Hindu architectural features and forms in the buildings of Akbar, for example, is representative of his liberal outlook and his generous patronage of indigenous artisans. His inscriptions make no mention of Hazrat Muhammad and demonstrate the emancipation of the State from the ecclesiastical control. Jehangir's love of nature and a care-free artistic temperament is well reflected in his terraced gardens and garden-pavilions. Shah Jehan's monuments, full of exhuberance and splendour, are representative of his golden age which is noted for prosperity, settled institutions of polity, security and development of arts and crafts.

The Mughal art of building has generally been misunderstood as an offshoot of Saracenic architecture based on Islamic techniques and forms. An intensive study of the monuments will however show on the other hand that it is as much a product of Indian art conceptions as is the art of Gandhara. Though it liberally utilised Islamic inspirations, it evolved fundamentally on the lines which had been prescribed by the ancient Indian architectural norms. It is representative of the amazing capacity of the Indian artisan to adapt himself to changed conditions and to assimilate the inspirations with which he is introduced from time to time. The Mughals thus employed the structural expedients of the arcuate order, e.g., the arch, the vault, the squinch and the dome, along with the trabeate features of typically Indian origin, like the pillar, the bracket, the beam, the *chhajja*, the corbelled pendentive, the oriel window, the *padmakosa* and the *kalasa* finial. The constructional techniques, as well as the instruments of construction, i.e., the *astsutrakam*, remained essentially Indian. The lines on the horizontal axis and the proportions of the vertical sections were much guidded by the ancient *Vastu*-texts. They also played a dominant part in planning and disposal of the details which had sometimes little functional value and were more guided by aesthetic consideration.

8. Sir Banister Fletcher, *A History of Architecture* (On the Comparative Method) (London, 1956), Preface, p. XI and p. 4.
9. James Fergusson, *History of Indian and Eastern Architecture* (London, 1876), Preface, p. VIII.
10. Cf. J. Burgess, 'The Architectural Antiquities of Northern Gujarat,' *A.S.I.*, New Imperial Series, Vol. XXXII (London, 1903), p. 98.

A study of the different stages of the evolution of the tomb will enable us to evaluate the amount of inspiration that was derived from indigenous sources and better understand the Taj Mahal at Agra as a culmination of the Mughal tomb architecture. It will be seen, for example, that the *Sarvatobhadra* plan of the ancient Hindus was suitably integrated with Babur's char-bagh in the Mughal tomb. The *Hemakuta* guided the interior arrangement. The dome, along with the four kiosks on the skyline, represented the *Panch-ratna* formula. As will be discussed in the following pages, the Mughal tomb had a striking resemblance to the Buddhist stupa with regard to certain important fundamentals.

Many other aspects of the Mughal tomb have not been brought to light. Akbar's tomb at Sikandara, for example, has a third tombstone which has been placed carefully in a secret storey. A dome probably formed part of the original design to crown this unique structure. It has specimens of all the prevalent schemes and styles of architectural ornamentation, including those of incised painting and fully developed inlay. Such a great monument as the Taj Mahal too has not been viewed in the correct perspective with respect to many obscure or controversial aspects, as for example, its origin, plan and design. That it is gradually sinking into the river has been confirmed by available data.

The art of tomb construction blossomed most exhuberantly in India under the Great Mughals. It was during their prosperous rule and in their artistic age that some of the best and the most magnificent tombs of the world were produced. Unfortunately, their rightful place has not yet been assigned to them. The Mughal style is widely misunderstood: it has generally been allotted, along with other Indian styles, Buddhist, Jaina and Brahmanical, a very inferior position in the non-historical class.[11] It is remarked that these styles 'remained detached from Western Art and exercised little direct influence on it.... These non-historical styles can scarcely be as interesting as those of Europe, which have progressed by the successive solution of constructive problems resolutely met and overcome; for in the East decorative schemes seem generally to have outweighed all other considerations and in this would appear to lie the main essential differences between Historical and non-Historical architecture.'[12] It is a matter to be seriously regretted that the great ingenuity and lucid skill of the Indian builder which enabled him to devise scores of structural expedients has not earned appreciation or even recognition. May be, the scholars did not have time or occasion to study intensively how marvellously the Indian builder has handled both the arcuate and the trabeate systems simultaneously. He evolved the arch in a variety of methods with scores of forms. Ultimately with the use of two stone slabs designed as semi-arches, but which were as a matter of course the modified form of brackets, he dispensed with the arcuate method of construction and supported the load on easily manipulative horizontal beams. He devised a wide variety of flat ceilings at the fort of Agra. By dividing it into smaller compartments or by providing an inner rotating *chhajja* supported by brackets, he reduced the total span and with this device he could provide flat horizontal ceilings for large halls without the use of pillars. He covered halls of 18 feet (5.49 metres) span with beams of 10 feet (3.02 metres) length without the use of pillars or pilasters! He supported the compartments of the flat ceiling in some cases on beautifully devised struts, and often combined the vault with the flat ceiling and the arch with beam and bracket.

The Indian builder worked on ancient architectural traditions which speak primarily of the *tala-chhanda*—the rhythm of the level, and of *urdhva-chhanda*—the

11. Cf. Fletcher, op. cit. (16th ed.), p. 888.

12. Ibid., p. 888.

rhythm of the elevation, implying the most proportionate measure which harmoniously connects the ground plan and the vertical section of a building. His three groups of lines, the *pramana-sutra,* the *paryant-sutra* and the *vinyasa-sutra,* determined the most rhythmical disposition of the plan. He expressed the horizontal parts in proportionate measurement with reference to the vertical ones and vice-versa, which shows that he treated his creation as a three-dimensional unit, interconnected in all its parts. The perfectly evolved *vastu*-canons have laid down precepts for the minutest details of the construction.

The assumption that in India decorative schemes outweighed all other considerations is definitely based on meagre and insufficient data; *silpa* and *chitra* (sculpture and painting) have always been treated in India as subsidiary and subordinate to *Vastu* (architecture). In the Mughal age, except for a few examples, e.g., the Chini-ka-Rauza and the Shish Mahal, the ornament has always been subordinated to the structure. It is the form as a whole which predominates. The Taj Mahal and the Moti Masjid stand as the most brilliant examples of structures that do not depend for their superbly graceful effect on any ornamentation, but on the style of their architecture. Particularly in the Moti Masjid, there is practically no decoration. It is far simpler than the Parthenon at Athens, the ornamentation of which—more than its structure—impressed Sir Banister and earned his whole-hearted applause: 'This miracle of architecture, compact of glistening marble, marvellous sculpture and glowing colour, has thrown its glamour over men through all the ages and more than justifies the poetic description of Emerson—"Earth proudly wears the Parthenon as the best gem upon her zone".'[13] This partiality is due to the fact that the Moti Masjid and the Taj are not properly understood. It is really shocking that the grotesque Egyptian boulders, the ruined heaps of Assyria—sometimes even monuments which no longer exist—could claim for themselves a better place than the Taj Mahal and the Moti Masjid in the annals of architecture.

Besides the Taj and the Moti Masjid, which need to be studied in detail and presented in the correct perspective they deserve, there are other representative buildings at Agra which occupy an important position in the evolution of Mughal architecture. Agra was the capital of the Great Mughals for nearly a century and saw some great days of prosperity and grandeur: it saw the Golden period of Muslim India. Delhi had Balban, Allauddin Khalji and Muhammad bin Tughlaq as its rulers, but in comparison to Akbar and Shah Jehan, the greatest of them all and master-builders, they were pigmies. Delhi saw the initial conquest —the demolition and desecration of the temples, indiscriminate slaughter, heinous murders, family feuds, struggles for the throne—it saw tombs constructed in fortresses. But Agra experienced a period of security and real prosperity; its tombs are built in beautiful char-bagh gardens, adorned with waterways, tanks and fountains. The Mughal tombs and mosques are representative of the perfection of the art of building. Muslim rule flourished most magnificently at Agra. Perhaps no other medieval city of India had such luck. Some of the buildings constructed by the Mughals at Agra are the finest specimens of their style and deserve to be studied in particular to enable them to earn for themselves their rightful place in the cultural history of India.

13. Cf. *op. cit.* (17th ed., London 1961), p. 123.

CHAPTER 1

Ancient Sepulchral Monuments

MAN BURIED his dead and erected suitable sepulchrals to perpetuate the memory from most ancient times. Burial was chiefly guided by his philosophical concepts. Ancient Egyptians strongly believed in a future state. They therefore carefully embalmed and preserved the bodies of their Pharaohs and erected enduring and tremendous tomb-pyramids over them. The necessary articles of life were also stored along with the dead body. They believed that the soul will one day return,[1] and that the dwelling house was only a temporary lodging and the tomb the permanent abode.[2] Tombs were constructed in the 'mastaba' form, were excavated into the rocks and, most popularly, in the pyramid form.

Pyramids were built with huge stone boulders in step-like tiers which were later filled in with packing blocks on all sides, thus sloping towards the core at the desired angle. The pyramid was not an isolated structure but the part of a complex of buildings which included the temples, halls, stores and other subsidiary structures, but it was undoubtedly the most important part.

The Pharaohs built magnificent pyramids in their own lifetime.[3] Great tomb activity spread from c. 3000 B.C. to 2130 B.C. during which the famous pyramids of Gizah were built respectively by Cheops, Chephren and Mykerinos.

Ziggurats were sacred, artificial, tiered mountain-temples of the ancient Mesopotamians who did not construct monumental tombs like the Egyptians. Excavations at Ur, in southern Iraq, have however revealed that the ancient Sumerians also buried their dead. And like the Egyptians they too deposited articles of daily necessities and personal belongings into the grave along with the body.[4] They also had a belief in some sort of future life. Some Royal tombs contain boats; in one case it is of silver, while others are of bitumen loaded with a cargo of vessels for food and drink, probably to ferry the soul to the other world.

1. Sir Banister Fletcher, *A History of Architecture*, 17th ed. (London, 1961), p. 22.
2. 'It was the after life and not the present which dominated Egyptian contemplation.' Cf. ibid., p. 22; also see p. 15.
3. Ibid., p. 26.
4. Sir Leonard Woolley, *Excavations at Ur* (London, 1955), p. 55.

A new era in tomb construction had dawned in Persia with the Achaemenids. Cyrus II died in 529 B.C. at Persepolis, the new capital. His body was brought back to Pasargadae to be interned in the tomb which he had constructed for the purpose.[5] The successors of Cyrus also built magnificent tombs near Persepolis. Darius I had his tomb excavated in the rock at Naqsh-i-Rustam, near Persepolis, in the beginning of the 5th century B.C.[6]

The Greeks also erected beautiful memorials to their dead. The most famous was built for King Mausolos (355-350 B.C.) at Halicarnassos. The word 'mausoleum'—meaning a monumental tomb or a funerary structure—has been derived from the same Greek tomb of king Mausolos.[7] The Greeks excavated tombs in the rocks also and examples of these are found in North Africa and Asia Minor. They used beautifully sculptured sarcophagi in their tombs, the one at Cnidos, dated c. 350 B.C., being among the most finely finished examples.

The Romans carried further the tradition of erecting monumental tombs over the remains of their Royal personnel. They practised cremation as well as burial: some of their tombs contain bodies while others preserve ashes.[8] The tomb of Augustus (25 B.C.) and of Hadrian (A.D. 135) at Rome are the most outstanding sepulchrals of the Romans.

Christian objection to cremation and preference for burial prevailed after the 4th century. Tomb-construction received a new impetus with burial coming to be practised almost invariably. The Byzantines built grand mausoleums. The tomb of S. Constanza, built at Rome by Constantine for his daughter in A.D. 330, the tomb of Galla Placidia at Ravenna, built in A.D. 420, and of Theodoric, also at Ravenna, built in A.D. 530, are among the best examples of this nature. The last one has ashes deposited in an urn.[9]

Excavations at Mohenjodaro and Harappa have revealed that the people of the Indus Valley Civilisation disposed their dead in all the three ways: they buried the body as a whole, buried fractionally after exposure and disappearance of the flesh, and buried ashes after cremation in specially built urns.[10] Urns were buried within dwelling houses or in close proximity. As it seems, no structures were raised over the bodies even when buried completely except probably the earthen mound which could signify temporarily the site of the burial.

The Hindus buried their dead in the age of the Rig Veda and the Atharva Veda. Later, post-cremation burial, and then only cremation, was practised.[11] A *smasana* (or cemetery) was provided for burning the dead. In cases of post-cremation burials, provision had been made to raise simple sepulchral mounds[12] over the pits into which the urns containing the bones were deposited.

Indian stupas were originally funeral mounds.[13] They were in existence prior to the advent of Gautama Buddha,[14] and were erected over the remains of the royal personnel as well as saints[15] and thus repre-

5. André Godard, *The Art of Iran* (London, 1955), p. 109.
6. Ibid., p. 113.
7. Fletcher, op. cit., p. 148.
8. Ibid., pp. 217, 218, 221.
9. Ibid., p. 297.
10. A.D. Pusalkar, *Vedic Age* (Bombay, 1965), p. 193.
11. D.R. Shastri, *Origin and Development of the Rituals of Ancestor Worship in India* (Calcutta, 1963), pp. 10-11.
12. Ibid., p. 33.
13. Sir John Marshall, *A Guide to Sanchi* (Calcutta, 1918), p. 30.
14. Alexander Cunningham, *The Bhilsa Topes* (London, 1854), p. 10; E.B. Havell, *Ancient and Medieval Architecture of India* (London, 1915), p. 46; A.K. Coomaraswamy, *History of Indian and Indonesian Art* (Dover ed., 1965), p. 30; S. K. Saraswati, *The Age of Imperial Unity* (Bombay, 1960), p. 487.
15. Cunningham, p. 11: '"Tope" or "tumulus" was the common form of tombs at that period'; Benjamin Rowland, *The Art and Architecture of India* (London, 1959), p. 45; V.S. Agrawala, *Indian Art* (Varanasi, 1965), p. 120: 'In Pre-Buddha tradition the stupa had come to be accepted as the monument associated with the life of a Mahapurusha.'

sent the oldest form of funereal structures. The Jainas too followed this tradition and erected stupas over the ashes of the Jinas, e.g., the one at Vaisali (Basarh) was dedicated to Munisuvrata and another at Mathura to Suparsvanatha.[16] The Mathura stupa was said to have been repaired in the time of Parsvanatha, c. 800 B.C.[17] Four other Jaina stupas seem to have existed at Mathura about the same time; one according to an inscription dated A.D. 167 is designated as 'Devanirmita' and is recorded as having been erected for Parsvanatha in 777 B.C.[18] Though originally a funereal structure, the stupa was adopted by the Jainas for worship prior to the practice of image-worship. Some Jaina sculptures recovered at Mathura, particularly the *ayagapatas*, unmistakably depict stupa-worship.

However it was the Buddhists who popularised the use of the stupa.[19] Gautama Buddha himself gave instructions to his disciple Ananda that his remains should be placed within stupas which should be erected at the four cross-roads, like the Chakravartis.[20] He thus gave sanction to the popular belief, and the stupa became associated with Buddhist religious rituals. Emperor Asoka ordered the surviving bodily relics of the Lord, e.g., teeth and bones, to be distributed and deposited into commemorative stupas which were erected at all the important places of the Empire. Thus a devotional aspect was established: the stupa became a symbol of Buddhist worship and was no more a funerary structure only. It might not have been an elaborate structure in its early phases, but with the great importance Asoka attached to its symbolism it became elaborate in plan and elevation. The stupa-form received great impetus, developed and ultimately culminated in the world famous stupas of Sanchi and Bharhut.

The stupa is the only funereal structure of the ancient Hindus (Brahmanical, Jaina and Buddhists). After Asoka it became a symbol and a place of worship, rather than a mausoleum pure and simple. As a matter of fact, the idea of the tomb does not fit in well in the Indian philosophical concept. The body is *nasvan;* it is composed of five elements which disintegrate and return to their respective places after death. The ultimate destination of the being is *moksha* or *nirvana*. Even such extreme materialists and atheists as the Charbakas did not attach any reality to the body: भस्मीभूतस्य देहस्य पुर्नागमनं कुत: ? (once this body is reduced to ashes it will never be received again). This view thus differed fundamentally from the ancient Egyptian concept of a future life which led them to preserve the body with utmost care and caution. The Hindus considered it only in terms of a simple abode into which the *atma jiva* or the being resides temporarily. They, therefore, practised cremation and did not normally care for the idea of preserving the ashes. Their architectural efforts were concentrated more on the production of the magnificent temple which is the *prasada* or the permanent House of the Gods. Precisely tomb-construction did not play any part in the pre-Muslim Hindu religious architecture.

16. U.P. Shah, *Studies in Jaina Art* (Banaras, 1955), p. 9; Saraswati, op. cit., p. 487.
17. Shah, p. 9.
18. Ibid., pp. 63-64.
19. Saraswati, op.cit., p. 487; V.S. Agrawala, *Evolution of the Hindu Temple* (Varanasi, 1965), p. 23.
20. V.S. Agrawala, *Studies in Indian Art* (Varanasi, 1965), p. 80.

CHAPTER 2

Early Islamic Tombs

ISLAM commanded its followers to bury their dead; it stipulated that the dead body must be laid in the grave with the head to the north and the feet to the south, the face being turned towards Mecca. It provided that only unburnt bricks and earth should be used to close the grave (Arabic—*maqbara;* Persian—*qabr*). To build a tomb over the grave with stones, burnt bricks or mortar or to write a verse upon it is strictly forbidden in the Hadis.[21] Hazrat Muhammad himself was very particular in this respect and prayed that 'God would not allow his followers to make his tomb an object of idolatrous adoration.'[22] According to Islamic mythology the dead will wait in their graves for the Day of Resurrection when seventy-two persons will rise from each grave. It clearly indicates that the grave should be covered with earth only so that during the course of time other dead bodies could be deposited in the same piece of land. The erection of monumental mausoleums is thus explicitly ruled out. It is a curious compulsion of human ambition to perpetuate a memory on the one hand and express love for the beautiful on the other that in spite of this strict orthodox injunction, surprisingly splendid tombs were constructed by the Mohammedans for themselves and for their dead.

No tomb of the Omayyids has come down to us, which indicates that originally the Muslims were not particular about tombs. The unsettled nature of the times was also responsible for this barren age. Though a marked change was felt after the overthrow of the Omayyids by the Abbasids in A.D. 750, the political turbulence continued to frighten the early Abbasid Caliphs. They did not wish the sites of their graves to be generally known for fear of their being dug up and turned upside down by their opponents. When al-Mansur died, a hundred graves were dug to create confusion.[23]

The earliest monumental tomb of Islam is

21. T. P. Hughes, *A Dictionary of Islam* (London, 1885), pp. 46, 48, 150, 635; He quotes from Mishkat (Book V, Chapter VI, Part I) the saying of Jabir, Abul Haiyaj Al-Asadi Jabir and Sad Ibn Abi Waqqas; E. W. Smith, 'The Moghul Architecture of Fatehpur Sikri, Part III, *A.S.I.*, N.I.S., Vol. XVIII (Allahabad, 1896), p. 27.
22. Hughes, op. cit., p. 183.
23. K. A. C. Creswell, *Early Muslim Architecture* (London, 1958), p. 320.

the Qubbat-as-Sulaibiya or the tomb of the Abbasid Khalif al-Muntasir, on the west bank of the Tigris. His Greek mother erected this tomb over his body after his assassination in A.D. 862. Later, two more Khalifs, al-Mutazz and al-Muhtadi, were also buried in it. It is octagonal in plan with a square central hall with an octagonal ambulatory rotating on all sides. The tomb of Hulaku at Maragha dated A.D. 1260 is another example of the octagonal type. Its best example outside India is the mausoleum of Uljaitu Khudabanda, the Mongol Khan of Persia (A.D. 1304-16) at Sultaniya. The octagonal plan and its other associate features appear here in a fully developed stage. Particularly noticeable are the triple arches on each of its octagonal sides.[24]

Among the most perfectly developed square tombs, the Gunbad-i-Surkh or the Red Tomb at Maragha is the earliest. It was built in 542 H. (A.D. 1147). The square mortuary chamber was roofed with a dome resting on stalactite squinches. It had been beautifully decorated with glazed tiles and brick work. The Turks were thus acquainted with both square and octagonal types of tombs when they established themselves in India in the last decade of the 12th century.

24. H. Saladin, *Manuel D'Art Musulman*, Vol. 1 (L'Architecture) (Paris, French edition, 1907), p. 345, fig. 267.

CHAPTER 3

Pre-Mughal Tombs In India

THE TURKS who established themselves in India did not have Islamic artisans with them. They were fighting against very heavy odds and except for a few unavoidable *mullas* (priests) for religious guidance, their long trains consisted of soldiers only. The Hindu artisan who had to be employed unavoidably by these early Turkish rulers of the Delhi Sultanate was a traditional master of stone-construction. He built on the trabeate system and spanned the spaces with horizontal beams which he supported on pillars with the help of brackets. He used the pendentives and ingeniously invented the corbelling to provide a circular roof over the *mandapa*. He rarely used a cementing agent as the huge boulders of his construction could rest securely one over the other without it by their own weight. He had a thorough background of thousands of years in the treatment of stone which he could handle almost like wax. In his profuse and exquisite carving work on stone, he could successfully and faithfully reflect life in its various forms and moods, as is evident from the sculptures of the temples of Khajuraho for example.

When called upon to work, he must have presented himself with his traditional files and chisels. He was conversant with the construction of the cruciform temple with pyramidal curvilinear *sikhara* over a *garbhagriha*, as was dictated by the individualistic form of religious worship. He must have embarrassed his new employers who wanted to build a mosque for congregational prayer or a spacious tomb with dome and arches. But with his amazing adaptability and capacity to learn new techniques and methods and to mould them in his own way, he posed no serious problem. Necessary supervision which was best available from among the Muslim retinue was provided to guide the Hindu builder. Probably plans were drawn; models of clay or wood were prepared; inscriptions were designed on paper in actual size and the Hindu artisan sat to work.

The first monumental Muslim tomb in India is the Sultan-ghari at Delhi, built by Shamsuddin Iltutmish for his son Nasiruddin Muhammad who died in A.D. 1231. The square courtyard has colonnades on the east and west sides and an octagonal platform

in its centre with a crypt underneath with the grave. The pillars and bracket-capitals are essentially Hindu, and the construction is trabeated. The corbelled ceilings are equally of Hindu extraction. The pillared construction of the Sultan-ghari had nothing to do with Islamic constructional traditions; the architect borrowed it from the Hindu temples, obviously from those which were appropriated and converted into the mosque at the Qutub. Whatever simple motifs have been used on the bases and capitals of the pillars too are typically Hindu and demonstrate the total dependence of the early Turkish rulers of India on the indigenous builders of the country.

The tomb of Iltutmish who died in A.D. 1236 marks a step forward. The interior of this square tomb has been profusely carved in stone. Conventional Hindu motifs like the half-*chakra*, lotus and bell have been used harmoniously with the essentially Islamic inscriptional designs consisting of Kufic, Tughra and Nastaliq characters. Bracket-stones and beautiful pilasters at the angles are Hindu, while the false arches with their pointed or cusped shape, derived inspiration from Islamic sources. Geometrical and conventional diaper patterns have also been used interspersedly. The inscriptional mural decoration of the hall is of exceptionally fine quality. It again reflects the art of the traditional Hindu builder who was slowly adapting himself to the requirements of his new masters. Not only was he successful in relieving the monotony of the plain surface of the interior as gracefully as he did in the temple, but he also ably and harmoniously mixed his own decorative motifs with those of his masters. The fusion of the two types of designs is perfect and complete and represents the lucid skill of the artisan and his capacity to master such varied and fundamentally different motifs and to use them together with an undiminished effect.

It is important to note that the arched shapes in the hall have been obtained with the help of overlapping courses, i.e., with the corbelling out of every upper course. It is the traditional trabeate or the horizontal system of construction of the Hindus which they had been using since ancient times. The Hindu artisan, under the guidance of his Muslim supervisor, however experimented here for the first time to construct a dome on the arcuate system. The square chamber was converted above into an octagon with the help of squinches constructed by overlapping courses at the four angles. This was again converted into a 16-gon with the help of simple pendentives supported on beautifully moulded bracket-stones. Thus a suitable base for the circular dome to rest upon was secured. The technique was not indigenous but was apparently inspired. However, the credit of materialising the idea into actual form with a great deal of success goes to the indigenous artisan. It has no true vault and no true arch either. It once more represents the high level of adaptability of the native builder.

No doubt, the experiment miscarried. The dome should have risen to a greater height to be in proportion to the space it roofed. Only then could its weight have been distributed evenly. But this only experience could have taught. The span of the chamber proved to be too much out of proportion for the maiden attempt and, at a later unknown date, the shallow dome collapsed. But the tomb of Iltutmish undoubtedly marks another stage in the development of Islamic architectural techniques in India as adopted and suitably modified by the Hindu master-craftsman in stone. He had been building in the past a spherical soffit composed of beams and brackets supported on twelve pillars on the corbelling system. He added to his knowledge and to his skill by taking recourse to the squinch and the dome which he learnt to manipulate in a few centuries until he was able to produce the most perfect examples under the patronage of the Mughals.

The next important tomb was constructed

over the remains of Ghiyasuddin Tughlaq (Ghazi Tughlaq)[25] about A.D. 1325 in a pentagonal miniature fortress, which originally stood on a rocky island in an artificial lake. It is built of red sandstone and marble. Though the interior is exactly in plumb, its outer walls have a determined slope, technically known as batter, thus giving it the appearance of a pyramid. Except on the western side where there is a blind or decorative arch, the remaining three sides have archways in their centre. Here in each archway a beam has been used along with the arch, thus combining for support both the systems, the Hindu trabeate and the Islamic arcuate. It is another sincere attempt at a fusion of two essentially opposed techniques. However unsuitable the arch in stone might have appeared to him, the Hindu artisan was not in a position to dispense with it; he could not have possibly over-ridden the directions of his Muslim overlord. But he could successfully convince him of the additional beauty and strength which a lintel could add to the arch.

In spite of the climatic requirements of the country, the Hindu builder was not allowed to introduce the *chhajja* or the supporting brackets—important members of Hindu construction. But he ingeniously suggested the idea of the bracket as a powerful support by using three projecting stones each on all the eight angles above the squinches, thus converting the octagon into a 16-gon, over which the single lofty dome rests. It is a well developed dome which beautifully crowns the tomb. Instead of the simple unimpressive metallic spike of Islamic origin, he introduced successfully the *amalaka* and the *kalasa*, the traditional crowning features of the Hindu *sikhara* or temple tower. These innovations, which proved to be suitable and appealed to the taste of his patrons, were not only retained but also modified and developed and we come across their almost unavoidable use in later monuments of the Sayyids, Lodis and Surs, and later on a more refined and elaborate scale in the Mughal buildings.

The tomb of Firoz Tughlaq who died in A.D. 1388 belongs technically to the class of the tomb of Ghiyasuddin Tughlaq. It is situated in the Hauz-Khas at Delhi. It is also square in plan with 45 feet (13.72 metres) side externally. An arched with lintel entrance similar to that in the tomb of Ghiyasuddin Tuhglaq has been provided in the centre of the east and south sides. A shallow semi-circular dome rests on an octagonal drum with a crested frieze. The dome has no crowning member, not even a metallic spike. The interior is a square chamber with squinches to support the dome. The Mihrab as usual in Islamic religious structures has been sunk in the western wall.

An orthodox point of view prevailed in the age of Firoz Tughlaq and unlimited restrictions seem to have been laid on the indigenous builder. He was not allowed in this tomb to take recourse to the *chhajja*, *amalaka* or *kalasa*. He has, however, used brackets to support the lintels of entrances. Another feature which he successfully introduced here for the first time is the stone railing on the south side platform. It is composed of uprights and two horizontal bars. In essence it imitates the stone railings of the Jains and the Buddhists, particularly those at Mathura and Sanchi. It is, however, plain and comparatively simple. The idea is undoubtedly indigenous. It suggests, as in the case of the stupa, an enclosure for a sanctified place. This is illustrative of the great ingenuity of the Indian builder who cleverly introduced this fundamentally Hindu feature in the tomb of one of the most bigoted Muslim rulers of medieval India.

Another feature of this tomb, which is typical of the Tughlaqian era, is the slope or a determined batter of its external

25. He built for himself a beautiful octagonal tomb at Multan which he later presented to Sheikh Rukn-i-Alam who now lies buried there.

walls.[26] It was absolutely an un-Indian feature which seems to have been inspired by the Islamic constructional techniques. Besides the fact that this slope on the exterior appeared unaesthetic, it presented an inexcusable disregard or ignorance of the architectural canons of India according to which the House of Worship was treated as *Vi-mana* or the one which is measured in parts. The greatest attention was devoted to the proportionate measurements (*pramana*) and the rhythm (*chandas*). The rhythmical disposition of the plan was determined by three groups of lines, *pramana-sutra*, *paryanta-sutra* and *vinayasa-sutra;* 'the method of expressing the proportionate measurements of the horizontal parts of the temple with reference to the vertical one and the vertical with reference to the horizontal shows that the building was regarded as a three-dimensional unit interconnected in all its parts.'[27] Even when buttresses were indispensable as in the case of the curvilinear *sikhara*, they belonged to the total form. In comparison, the sloped features of the Tughlaqian buildings, i.e., the batter of the external walls, conical bastions and tapering turrets, are the dismal remnants of inartistic and unaesthetic tendencies of a fanatical class of religious jurists. The slope in either case is a foreign conception without concurrence or affinity with the local traditions of art and architecture. It is so much against the spirit of the Indian people who love beauty as much as they love ideas and do not worship mere unhewn stones that these features remain as sad and ugly memories of an age which was noted for the ecclesiastical control and consequently the banishment of the art-susceptibilities. Completely devoid of the plasticity of the Hindu art they appear here on this soil as belonging to an isolated movement without fulfilling any art purpose

26. The tomb of Rukn-i-Alam at Multan too has batter on each of its octagonal sides on the exterior.
27. Stella Kramrisch, *The Hindu Temple*, Vol. I (Calcutta, 1946), pp. 132-33, 227-38.

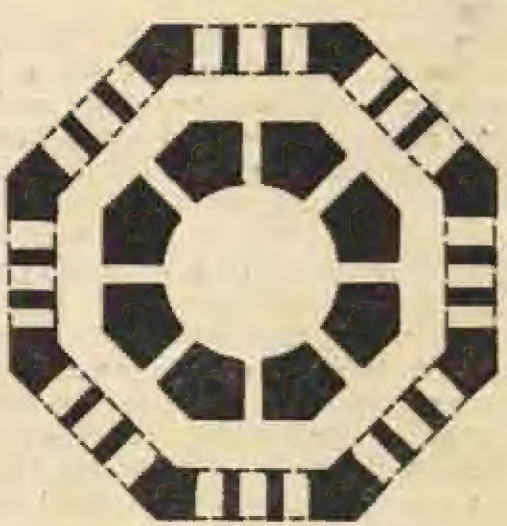


FIG. 1
Plan of the tomb of Khan-i-Jehan Telingani

or without contributing anything to the evolution of Indian architectural forms.

However before the tomb of Firoz was brought into form the master-craftsman of India had made an innovation. Hitherto the tomb had been square in plan which necessarily involved the difficulty of superseding it with a circular dome. At the tomb of Khan-i-Jehan Telingani,[28] built after his death in 770 A.H. (A.D. 1368-69), near the tomb of Nizamuddin Auliya at Delhi, he made a first attempt to adopt an octagonal plan and from this standpoint the tomb of Telingani occupies a very important place in the evolution of the tomb in India (Fig. 1). Each side of the octagon, which has a diameter of 74 feet (22.56 metres) contains three arches. Over them rotates a broad *chhajja* supported on simple bracket-stones. Eight cupolas have been arranged above the battlemented parapet, one on each octagonal side around the dome. The dome is crowned by a beautiful finial which carries a massive

28. He was a native of Telingana and embraced Islam. He received the new name Maqbul and the title of Qawamu-l-Mulk and the fief of Multan during the reign of Muhammad bin Tughlaq (A.D. 1325-51). He was later raised to the exalted position of Naib Wazir. After the death of Muhammad bin Tughlaq, he uplifted the cause of Firoz and as a reward received the office of the Wazir and the title of Khan-i-Jehan.

1. *A typical square tomb in Delhi.*

2. *Tomb of Ghiyasuddin Tughlaq, Delhi.*

3. *General view of the tomb of Sher Shah Sur, Sasaram.* (Copyright, Archaeological Survey of India)

4. *Dome of the tomb of Firoz Khan, Agra.*

5. *Tomb of Sadiq Khan, Agra.*

6. *Tomb of Humayun, Delhi.*

7

8

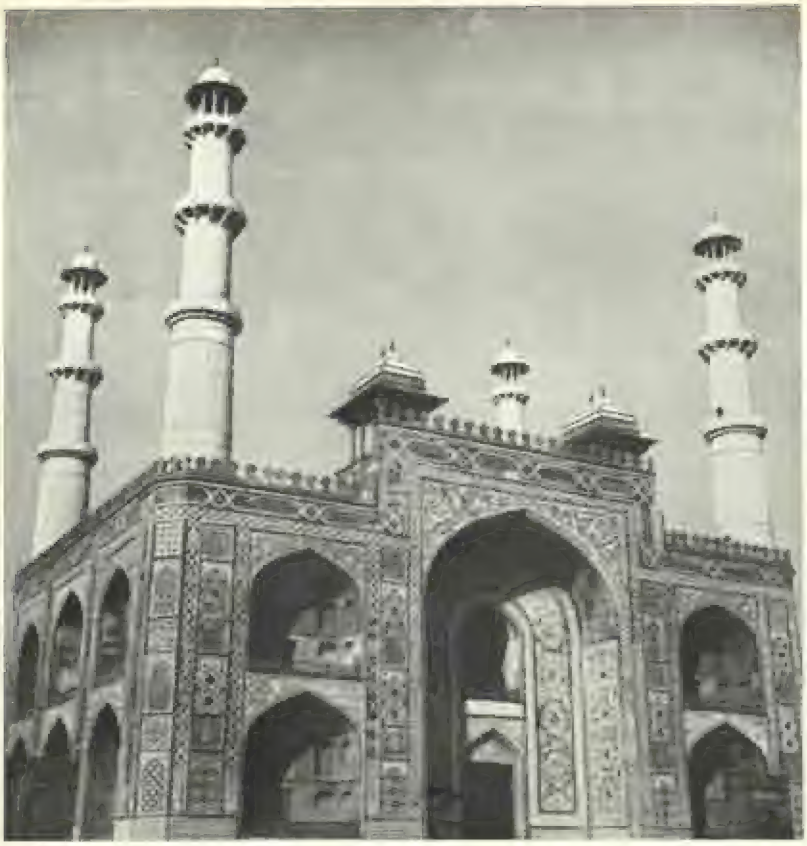
9a

9b

9a. *Akbar's tomb, Sikandara.*
9b. *Conjectural restoration of above with dome.*

7. (Previous Plate). *Tomb of Muhammad Ghaus, Gwalior.*

8. (Previous Plate). *Western Gateway, Akbar's tomb, Sikandara.*



10. *Facade, Southern gateway, Akbar's tomb, Sikandara.*

11. *Upper pavilions, Akbar's tomb, Sikandara (from second floor terrace).*

12. *Serpentine bracket struts, tomb of Salim Chishti, Fatehpur Sikri.*

13. *Tomb of Salim Chishti, Fatehpur Sikri.*

14. *Tomb of Mirza Ghiyas Beg, Agra (from western pavilion).*

15. *Mosaic work, Tomb of Mirza Ghiyas Beg, Agra.*

amalaka. The interior is composed of a single octagonal chamber enclosed by a verandah on all sides. The construction is in rubble and mortar, which had been adequately plastered over. Dressed stone has also been used for strength as well as for emphasis.

Though the building is badly out of proportion and lacks effect, it undoubtedly marks an important stage when greater liberty was allowed to the Hindu artisan. He retained the arch and the dome but confidently introduced the bracket-form, the *chhajja* and the *amalaka*. The fusion and blending of the two techniques is harmonious.

The plan seems to have been devised by the architect himself; the experimental trend is more than confirmed here by its crude and imperfect proportions. Though the Qubbat-al Sakhra at Jerusalem (also called 'The Dome of the Rock' and the Mosque of Omar who founded it in A.D. 643) and the Qubbat-al Sulaibiya, the former a mosque and the latter a tomb which has already been referred to above, are octagonal in plan, neither of these two can be linked with the tomb of Telingani in Delhi. Three arches on each octagonal side, a *chhajja* supported on bracket-stones, cupolas on the terrace, and the crowning parts of the dome are some of the features which are not met with in the earlier Islamic examples.

The sepulchre played a very important part in the development of the tomb architecture in later ages. Percy Brown correctly believed that 'from this comparatively small beginning were developed those large and stately mausoleums of octagonal conformation which imparted such a distinctive character to the subsequent architecture of northern India and also elsewhere.'[29] The magnificent tombs of Mubarak Shah Sayyid and Muhammad Shah Sayyid, of Sikandar Lodi and of Hasan Khan Sur and Sher Shah Sur, the first three in Delhi and the last two at Sasaram in Bihar, were constructed on the same plan and design, duly modified, elaborated and refined in each case. The tomb of Telingani undoubtedly served as their prototype. Though square tombs continued to be built, the architect now devoted himself whole-heartedly to the perfection of the octagonal tomb before the advent of the Mughals. The plan ultimately culminated in the splendid tomb of Sher Shah at Sasaram (A.D. 1545) and Firoz Khan Khwajasarai at Agra (A.D.1647).

The tomb plan thus resolved itself into two distinct channels—the square and the octagonal. The creative and inventive Indian builder was not prepared to imitate an earlier example; every time he made the best use of the experience he had gained and refined and elaborated every new construction. He put aesthetic norms to the hardest test in each case. Both types of the tomb thus evolved, underwent tremendous changes in details, and were finally perfected.

While the octagonal plan of the tomb was reserved for Royal burials, the nobles and other persons of high rank were buried in square tombs, as a matter of practice. The square plan was in vogue under the Sayyids and the Lodis during the whole span of the 15th century. Some important examples have survived in Delhi, e.g., the Barakhan-ka-Gumbad, the Chhotakhan-ka-Gumbad, the Bara Gumbad, the Shish Gumbad, the tomb of Taj Khan, the Dadi-ka-Gumbad and the Poli-ka-Gumbad. Most of them are isolated structures without gardens or water-devices, enclosing walls or any other subsidiary structure.

The square tomb is generally one-third smaller in plan but about one-third higher than the octagonal type. In all square examples the interior consists of a single square hall which contains the tombstone roofed by a massive, broad, high, mostly single, dome obtained by means of squinches, stalactite or pendentives. The western side is invariably closed with an arched *mihrab*.

29. Percy Brown, *Indian Architecture*, Islamic Period (Bombay, 1968), p. 25.

It is, however, the exterior which has very skilfully been treated by the architect. In some examples, e.g., at the Barakhan-ka Gumbad, each facade is composed of three false storeys or arcaded zones, having in the centre a rectangular projecting frame, containing again a false recessed archway in receding planes. It occupies nearly the total height of the tomb almost to the parapet which is slightly raised in the centre. In some cases, e.g., at the Chhotakhan-ka Gumbad, only two false storeys have been provided. The architect introduced these as a refined form of architectural decoration. The entrance is almost invariably provided for by a lintel supported on brackets, or corbelled stones. As the plinth is sufficiently raised, the entrance is made accessible through a comfortable flight of steps. The space above the trabeated entrance is filled in by one or two arched window openings.

The superstructure has been manipulated very skilfully. It consists of a broad massive high dome resting on a prominent drum, and crowned by lotus-petals (*padamakosa*), an *amalaka* and a *kalasa* finial. It is flanked on each corner of the square mausoleum by a beautiful *chhatri*, square or octagonal, as the space allowed. Besides, turrets rise magnificently above the skyline from every angle of the structure as well as from the angles of the octagonal or the 16-gon drum. The greatest bulk of the dome towers emphatically over these slender features, the whole harmonious combination providing great aesthetic satisfaction.

As Percy Brown rightly pointed out, the Allai Darwaza at the Qutub in Delhi, built about A.D. 1311, served as the prototype of the square type of the tomb. It was there for the first time that the architect provided a single interior hall with two false storeys externally.

The square tomb has no sloping members, neither buttresses at the angles as in the octagonal type nor tapering turrets or battered walls as in the mosques of the Firuzian era. All the lines and planes of the square tomb are accurately vertical and in plumb. This type of tomb structure represents the success of the Indian mason to exclude from his creation the sloped features of an unquestionably un-Indian origin. Slowly and gradually he was able to convince his patron of the uselessness of these features that in no way added to the strength or to the aesthetic character of the building.

The octagonal tomb differs from the square type in dimensions and also in the disposal of the details. It is one-storeyed exteriorly as well as in the interior which is composed of a single hall roofed by a single dome. A verandah runs all round this mortuary chamber. The entrances in the hall are provided with arch-and-beam openings, a feature which is characteristic of this age. Each external side of the verandah has three pointed arches, the two on each side generally being slightly narrower than the central one. An imposing *chhajja* supported on bracket-stones rotates above the aches on all sides. The broad massive dome has typically Hindu crowning features like the lotus-petal, *amalaka* and *kalasa* finial which have been used so emphatically as to occupy a dominating place in the total effect of the superstructure.

While all the lines of elevation are accurately vertical, curiously enough, the buttresses have been attached to all the eight angles of the octagonal structure. This is a typical feature of the octagonal tomb. The introduction of this sloped element may have been dictated by the Muslim patron from the point of view of additional strength or added beauty. However, it was definitely a better and a more refined substitute for the battered walls which were introduced at the tombs of Ghiyasuddin Tughlaq and Firoz Tughlaq in the 14th century.

It is the superstructure which plays a predominant part in the total aesthetic effect of a building. The architect, therefore, devoted the greatest attention to the refinement of the superstructure along its elevational as well as its horizontal axis. The tomb of

Mubarak Sayyid has a 'sunken' or 'pressed-down' appearance. The architect improved the superstructure at the tomb of Muhammad Sayyid. He raised the drum of the dome and the kiosks around it. The superstructure thus became sufficiently visible and was not masked by the lower and projecting parts of the mausoleum. At the tomb of Sikandar Lodi, he raised it further. The *chhatris* were dispensed with in this case, and the turrets attached to the body of the dome. The ornamented drum thus stands well over the parapet and the broad massive dome above it is allowed to crown gracefully the whole structure. The proportions have thus been admirably refined.

The dome of the tomb of Sikandar Lodi is an accomplished example of the double-dome type. The single dome had already been raised too high and now it had become quite out of proportion with the interior. Guided by the necessity of still raising the height of the dome, a double-dome was devised, first at the tomb of Taj Khan about A.D. 1501. This device provided space between the outer and inner shells of the dome structure. Thus, while it provided a suitable and proportionate ceiling to the interior hall, at the same time it enabled the builder to raise the height of the dome as much as he desired in order to present a lofty and an imposing exterior. The outer elevation could now be controlled without disturbing the proportions of the interior. This was a significant achievement and much facilitated the work of the architect.

While the three arches on each octagonal side and rotating verandah round the single octagonal mortuary chamber have been retained in the tomb of Hasan Khan Sur at Sasaram, the buttresses at the angles, which were the most characteristic features of the earlier examples, have been dispensed with. The superstructure has been further elaborated. The drum has been elevated almost to the dimensions of a second storey. A *chhatri* rises from each of its eight angles, harmonising well with the cupolas on the lower storey. The dome is extraordinarily massive and broad and is crowned by equally imposing lotus-petals, *amalaka* and finial. The superstructure is thus almost double in height in relation to the ground floor.

The tomb of Sher Shah at Sasaram, built around A.D. 1545, is the most perfect and successful example of the octagonal type. To provide it with a beautiful setting it has been set in the centre of a lake and is connected with the land by a causeway. Its dimensions have been enlarged to a colossal size on the horizontal as well as on the vertical axis. The tomb is composed of five storeys including the stepped square basement rising directly out of the water and the square plinth on which the tomb proper stands.

It retains all the fundamentals of the tomb of Hasan Khan. But instead of the cupolas of the latter, here a beautiful octagonal *chhatri* rises from each corner. The drum resolves itself into an independent storey having on each angle a similar *chhatri*. It must be noted that only the combination of the *chhatris* provides the necessary rhythm and harmony to the spherical dome and this feature could best be understood and utilised by the traditional *sikhara*-builders of India. The extra height of the drum gives a towering and an imposing elevation to the dome which is high, broad and majestically superimposed upon the whole structure. It is crowned by a massive lotus-petal, *amalaka* and a grand finial. This is one of the largest domes in India and is some 13 feet (3.96 metres) wider than the more famous dome of the Taj Mahal.

The calm and stately dignity of the tomb of Sher Shah is very commendatory. The proportions have been maintained harmoniously in the transition from square to octagonal and from octagon to sphere. The whole impression is that of magnificence and grandeur. The *chhatris* and the crowning of the dome undoubtedly play a very important part in the total aesthetic effect of the monument.

The provision of a massive pillared pavilion at each angle of the main plinth was an innovation ingeniously devised by the Indian builder. The feature was undoubtedly a fore-runner of the *minars* later adopted as attached or detached by the Mughals to supplement their tomb structures. It marks an important stage when such subsidiary constructions were considered to be necessary to present the main structure in a more beautiful perspective. The tomb was no more a solitary and isolated construction but was properly and suitably flanked on all sides. This added considerably to the overall aesthetic effect and later this feature, further refined and elaborated, was unavoidably maintained.

The tomb of Isa Khan, built in A.D. 1547, and that of Adham Khan who died in A.D. 1561, both in Delhi, belong to the same octagonal type. The latter is not the last example of this type as is generally presumed. Two very important examples, both at Agra, have come down to us. One is the tomb of Sadiq Khan. It is situated in the suburb of Sikandara in the neighbourhood of the tomb of Salabat Khan, and was built near the end of the 16th century for Sadiq Khan, one of the spiritual guides of Akbar. A very high plinth, a portal with an engrailed arch on each of its eight sides instead of the usual three, a narrow whispering gallery above the portals overhanging and rotating around the upper part of the central hall, an extremely projecting *chhajja* supported on brackets going round the building, pinnacles at the angles, and the spiral flutings of the double-dome which splendidly crowns the tomb are some of its characteristic features.

The tomb of Firoz Khan at Agra (Fig. 2), situated on the Gwalior Road in the village 'Tal Firoz Khan' is the last specimen of the octagonal type of tomb. It was built for Firoz Khan Khwajasarai, the superintendent of the female apartments, around A.D. 1647. This is a magnificent mausoleum, built entirely of red sandstone, and has a unique plan. The gateway has been incorporated

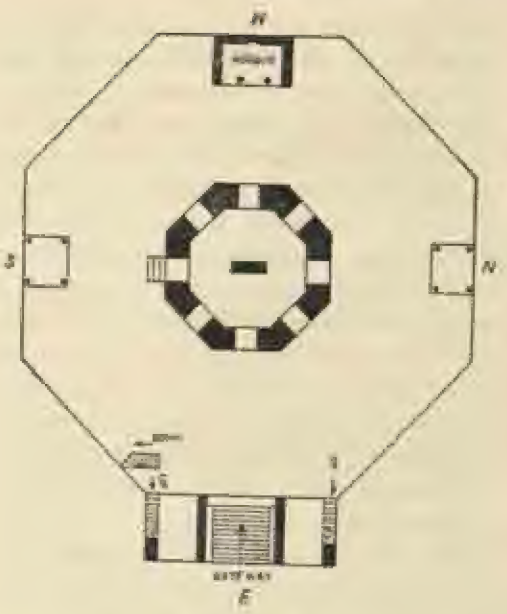


FIG. 2
Plan of the tomb of Firoz Khan at Agra

on the eastern side of the octagonal tomb. Instead of an archway leading direct into the mausoleum, a broad high stairway leads above to the terrace or the upper storey; the ground floor has thus been reduced to the status of a subsidiary storey. Inspiration for this device has obviously been derived from the Hindu temple where an attached porch or high stairway often plays the same significant role in the whole construction. Among other characteristic features of this tomb may be counted its typically unmatched dome, highly sophisticated and conventionalized patterns in a sculpturesque decor, and the complete absence of Arabic inscriptions. This is the only building of its type and by comparison is only inferior to masterpieces like the Taj, the tombs of Akbar and Itmad-ud-Daulah, the Moti Masjid and the white marble pavilions of Agra and Delhi forts.

Even before the advent of the Mughals, a compromise had been arrived at between the square and the octagonal types, in consequence of which the octagonalised-square plan had been invented as is most faithfully reflected in the Lodi tomb at Agra,

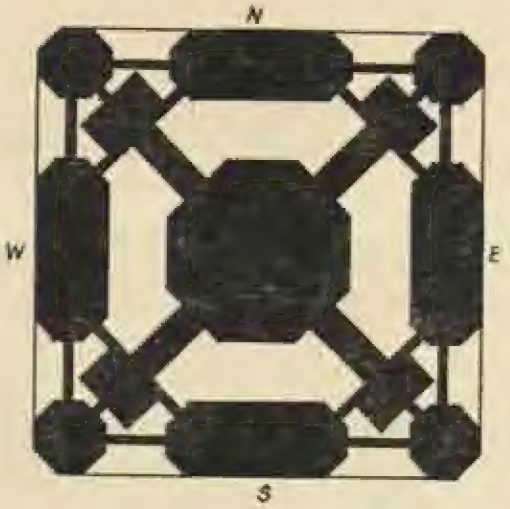


Fig. 3
Plan of Lodi tomb at Agra

built between A.D. 1517 and 1526 (Fig. 3). While the plan of this tomb remains essentially square, its angles have been chamfered so as to give it an octagonal appearance. The interior arrangement too has been modified accordingly. This is a perfect specimen of its type at Agra, representative of a style prevalent in the pre-Mughal days, the characteristic features of which were the typical four-centred Pathan arches, the *chhajja* supported on typical brackets, and rubble and brick construction with excessive mortar and plaster-work applied sometimes on stone surfaces with very sparing use of painting (Fig. 4). It seems that some features of this tomb such as the detached *chhatris*, the chamfered plan and the interior arrangement, served as guiding factors to the architect of the Taj Mahal.

Fig. 4
Pre-Mughal tomb

CHAPTER 4

The Mughal Age of Magnificent Mausoleums

EXCEPT for a few examples of the octagonal type, the tomb plan during the whole span of the Mughal rule remained essentially square. Of course it is not always the exact square plan which the Mughals adopted; in almost every case it has been modified according to aesthetic considerations. For example, a porch has been attached to the square plan at the tomb of Salim Chishti at Fatehpur Sikri. Towers have been introduced at the angles at the tombs of Muhammad Ghaus, Akbar, Itmad-ud-Daulah, and Jehangir. Attached or detached corner kiosks have been used with the square plan at the tombs of Mariam Zamani, Itibari Khan, and Salabat Khan. And finally there are the octagonalised square tombs, e.g., the tombs of Humayun, Abdur-Rahim Khan-i-Khanan, and the Taj Mahal.

When Babur came to Agra in May 1526, he was much troubled by its excessive heat, hot winds and dust.[30] There were few gardens and no running water which could have relieved the tortures of the blazing summer days of this region. He was utterly disgusted with the dry face of the earth and recorded his reproaches in his memoirs.[31]

For all practical purposes there was little or no arrangement for artificial running water. He lamentably, and no doubt faithfully, recorded this drawback: 'The greater part of the Hindustan country is situated on level land. Many though its towns and cultivated lands are, it nowhere has running waters. Even where, as for some towns, it is practicable to convey water by digging channels, this is not done.'

Babur laid out gardens systematically and provided them with running water in different beautiful ways. He used the 'rehant' system to ensure a continuous supply of water in the channels which fed lily-ponds, water-chutes, waterfalls and other enchanting devices. It was in the midst of such beautifully laid gardens that he built his pleasure pavilions and palatial mansions. Babur in this manner made an epoch-making innovation; he gave the medieval architecture a new direction and undoubtedly an unprecedented new definition and impressiveness.

30. He observes, 'Three things oppressed us in Hindustan—its heat, its violent winds and dust.' Cf. *Baburnama* (Beveridge) (London, 1921), Vol. II, p. 532.

31. Ibid., pp. 487, 531-32.

This way he associated architecture with gardens and water-devices. The great innovation—the introduction of these features—brought about a fundamental change in the planning of tombs and palatial apartments. Henceforth, it was not the architect alone who planned; the garden-designer and the water-engineer collaborated with him in the fundamentals as well as in details, with the object of co-ordinating each element to produce a unified composition.

Babur revolutionized the whole art of building. Hitherto the tombs were isolated structures. Except for the tomb of Sher Shah at Sasaram which stood in the centre of a lake, pre-Mughal tombs were solitary constructions contained sometimes within miniature fortifications with no setting or garden planning. The features which Babur introduced gave new colour and character to the medieval architecture of India. The Mughal tomb did not stand in stern isolation, but was impressively presented in a charming setting, through the garden, the stone-paved water-channels, stone tanks, and water-chutes—all arranged symmetrically as part of the whole scheme.

This was an important landmark in the history of Indian architecture. Previously architeture was rarely associated with gardens and water-devices in the way the Mughals did. The beautiful garden and provision for running water now could give the structure an impressiveness which was hitherto unknown. The credit for this master-stroke in the art of building undoubtedly goes to Babur who gave expression to his appreciation of the beautiful in an impressive way. He was much moved by the ethereal effect of the char-bagh or the traditional four-quartered garden of Persia with which he was fairly well acquainted during his turbulent career and of which he had read in Persian poetry, particularly in the poems of Firdausi, Sadi, Hafiz, Khayyam and Nizami. The garden-craft as Babur founded it in India was based on the fundamental principle of planning a

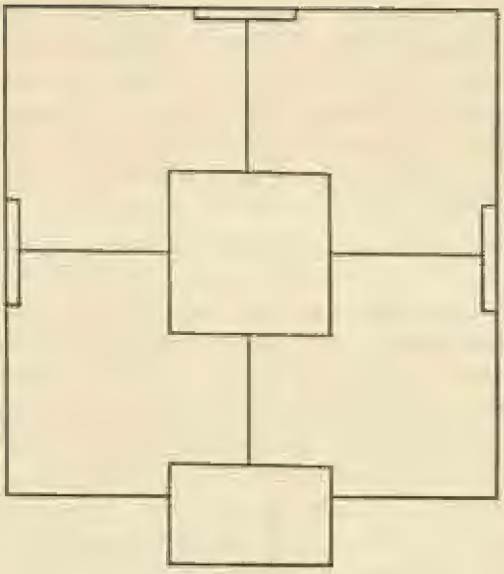


FIG. 5
Char-bagh plan

house, palace or tomb in harmonious relation with water-devices—canals, tanks, water-chutes and fountains—and in an equally harmonious relation with tree-avenues and flower-beds.

Babur's innovation was ably followed by his descendants and they carried it still further to splendid heights. They designed their tombs invariably on the char-bagh plan, the tomb structure occupying the central, and thus the most important place, in the whole project (Fig. 5). The garden and its associated water devices formed an integral part of their tomb-architecture. The Mughal tomb, from Humayun's grand mausoleum to the magnificent Taj Mahal, owes much of its grace to its garden-setting.

TOMB OF HUMAYUN

The tomb of Humayun is the first great monument of the Mughals in which the idea of the char-bagh has been skilfully incorporated. The tomb-structure occupies the central position in the enclosed area which is divided into four quarters, each separated from the other by causeways with sunk water-channels and lily-ponds at regular intervals. The garden is made up of

numerous little channels, with raised paths on either side, ultimately leading to the central point. Small tanks with cusped and trefoiled borders intermittently ornament the pathways. Tiny water-chutes or *chadars* have been used effectively in the channels down which the water softly ripples. This is a characteristic feature of the garden of Humayun's tomb. The rhythmic flow of water into the channels, mixed with the gurgling splash of the fountains and the sweet rippling of these waterfalls, infuses life into the adjoining cypress-avenues, the pergolas and the beautiful flower-beds. The garden surrounds the main building on all sides, and with its flower-parterres and avenues all carefully designed and proportioned, provides it with a perfect setting. The tomb is set beautifully amid a number of environmental cues like the garden and the associated water-devices which thus form an integral part of the architectural composition.

Each side of the enclosed area has a gateway in the middle, that on the western side being the most imposing and monumental as it was intended to be the main entrance. The tomb occupies the central position on a wide and spacious plinth of 22 feet (6.71 metres) height whose sides are arcaded and have vaulted rooms which support the superstructure. The real grave seems to have originally been in the central deep and dark room under this terrace. The tomb itself is square with 156 feet (47.54 metres) side, its angles being chamfered, thus giving it an octagonalised-square plan. Each facade of the tomb is composed of a central rectangular fronton containing the great *iwan* (arched portal) crowned above the parapet with a beautiful square *chhatri* and a turret on either side. The *iwan* is flanked by wings, each wing again having a central arch or a smaller *iwan* having on either side two small arched alcoves one over the other.[32] The amount of chamfer on each corner of the tomb is repeated on both sides of the central great *iwan*, thus giving it certain beautiful angular projections. The angles of each facade are relieved by pilasters which are crowned by slender pinnacles above the parapet. Above all is the grand bulbous dome, 140 feet (42.67 metres) high, flanked on all the four sides by four *chhatris*. It has no lotus-petals, *amalaka* or *kalasa* finial and only the Persian spike—a bit adjusted to the Indian requirements—has been used to crown the dome. The interior consists of a central octagonal hall with four octagonal chambers at the corners and four side rooms, all interconnected by means of passages.

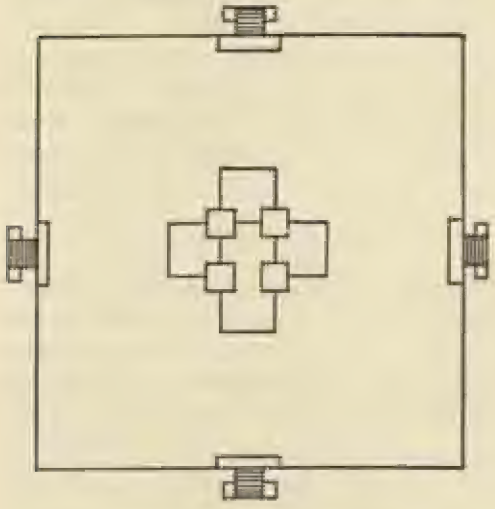


FIG. 6
Plan of the Sarvatobhadra temple

There is no doubt that the idea of the char-bagh, a four-quartered garden surrounding the tomb-structure on all four sides was introduced into India by Babur. The square plan of the main structure, approachable from all the four sides, was however known to the Indian builder since ancient times. Particular mention may be made in this connection of the Sarvatobhadra temple (Fig. 6), which has a square plan and has been dealt with in detail in

32. These wings cannot be identified as attached towers as Cunningham and Carr Stephen presumed. Cf. *The Archaeology and Monumental Remains of Delhi* (Calcutta, 1876), p. 205. They essentially formed part of the main building and are not attached subsidiary structures.

the ancient *Vastu*-texts of India, e.g., *Visvakarmaprakasa*,[33] *Matsya-Purana*, *Samarangana-Sutradhar*[34] and *Brhat-Samhita*.[35] *Vishnudharmottara* is most explicit in this respect. The Sarvatobhadra has been included in the eighth group which comprises the temples whose *mandapas* formed essentially a part of the plan, occupying the four directions around the *garbha-griha*[36] with entrances at the four cardinal points. Naturally, these cross-shaped temples had one central *sikhara* (i.e., over the *garbha-griha*) and four subsidiary *sikharas* on the four sides (i.e., over the four *mandapas*) materialising the *panch-ratna* formula of architectural symbolism. The Sarvatobhadra temple belonged to this group and was constructed on an elaborate and refined scale. This temple was raised on a broad, square terrace (*jagati*), was enclosed by a rampart (*prakara*), and could be reached on the four sides by stairs. *Devakulas* were provided at the corners of the terrace. The main temple occupied the central position. It had a square *garbha-griha* surrounded on the four sides by *mandapas* and in the four corners by small chambers. 'This cross-shaped, central and radiating building is surmounted by a cluster of nine sikharas corresponding to the four mandapas, the four small corner prasadas and central garbha-griha. The central sikhara is higher and dominates the eight surrounding sikharas. Around the central shrine beautiful tanks are laid out on the terrace.'[37]

This description fundamentally corresponds to the plan of the tomb of Humayun and as there is no such prototype traceable in Persia or any other Islamic country it seems that the plan was adjusted to the idea of Babur's char-bagh by the Indian builder who could successfully transfer it from a Hindu temple to a Muslim tomb. Though intermediary links, which could have provided examples of this plan, are missing the art of India is a living art and no wonder the ancient *Vastu*-canons could furnish the builder with the necessary prescriptions which inspired the whole idea of this unique square plan.

The tomb was constructed between A.D. 1564 and 1570 and was financed by Haji Begum, a widow of Humayun. Percy Brown held the view that Haji Begum, while she was in Persia with her husband, 'absorbed something of the artistic spirit of Persia.' He observes that artisans were procured from Persia for its construction, the Arab Serai could have accommodated these Islamic builders, and that its architect was 'Mirak Mirza Ghiyas almost certainly of Persian origin.' He writes that 'perhaps the nearest definition of the architectural style of this monument is that it represents an Indian interpretation of a Persian conception, as while there is much in its structure that is indigenous, there is at the same time much that can only be of Persian inspiration.' He makes particular mention of three features of Persian origin: the grand bulbous dome, the great arched alcove in each facade, and the complex of rooms and corridors forming the interior arrangement.

Brown over assesses the amount of Persian element in the conception of this tomb. Its bulbous double dome might have been inspired by the dome of Gur-i-Mir and other domes of Shah-i-Zinda at Samarqand in Central Asia which shape—as resting on an extraordinarily high drum— is evidently bulbous and is closer to the dome of Humayun's tomb (and the dome of the Taj) than any other dome in Persia or elsewhere. The great arch is no doubt of Persian origin and can better be designated as the *Iwan*. The interior arrangement however owes nothing to Persia. We have almost an identical disposal of rooms and passages in the Lodi tomb at Agra, built in the first quarter of the same century. It seems to be only a

33. VI-88-89. Cf. Stella Kramrisch, *The Hindu Temple*, Vol. II, p. 419.
34. LVI-131-32; XLIX 107. Cf. ibid.
35. LV-27. Cf. ibid; it was the first of the 4-room buildings, i.e., having four wings (*Chatussala-griha*). Cf. LII-31.
6. Kramrisch, op. cit., p. 416.
37. Ibid., p. 419.

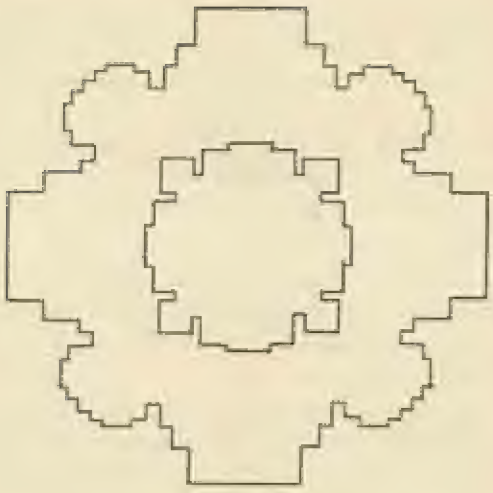


FIG. 7
Plan of the Hemakuta temple

modified plan of the Hemakuta temple (Fig. 7), that had an ambulatory outside the wall of the *garbha-griha* (called *Andhakarika* or dark ambulatory) which was enclosed by the outer wall of the temple.[38] This was known to the Indian builder and so the interior plan of the tomb probably owes its origin to him rather than to Mirak Mirza Ghiyas or any other Islamic builder. It was the indigenous builder who introduced, as Percy Brown also notes, the fanciful kiosks with their elegant cupolas, and who produced the excellent masonry so artistically combined with marble. The dome with the four cupolas represents the *panch-ratna* symbolism of ancient Indian architecture. The interior arrangement was inspired by the plan of Hemakuta temple and the square plan of the main tomb structure by the Sarvatobhadra. Babur's idea of char-bagh with gardens, paved causeways, channels with running water and other beautifying accessories, provided it with an exquisite setting. These fundamentals were followed later at the Taj Mahal where they have been used on a still more refined and evolved scale.

The tomb of Humayun is an outstanding landmark in the development of the Mughal style. It is here for the first time that all the inspirations combined, magnificently fused and adapted, one with the other. It set out norms for the later tombs of the Mughals. There is no doubt that the builder successfully materialised his brilliant conception to make it one of the grandest sepulchral monuments in India. 'The exceptionally satisfying appearance of this building and the lucidity of its composition have been obtained by the skilful realization of all those qualities essential in a great work of art. The structural relations of the plan to the design of both the exterior and interior are manifestly logical, while the correct principles of good building have been unfailingly observed throughout. These factors together with the finished amassment of the various parts, each one elegant in itself but rendered more so by the propriety of its position, are responsible of the superb effect of this monument. Added to these are the perfection of its proportions, the interplay of its surface and planes, the shapes and judicious distribution of the voids, the graceful but bold curves of the arches and above all the grand volume of the dome...Not a little of the artistic result is due to the materials employed, the red sandstone and white marble of which it is composed being admirably blended.'[39]

That the construction of a Muslim tomb could be undertaken on such a grand scale is an important point of study. It is not a mere embodiment of a funerary memorial but something more than that. The idea developed to extraordinary dimensions and in it were involved the efforts of not a few persons but a huge department of building affairs, maintaining efficient architects and artisans and having a considerable part of the royal treasury at its disposal. It was no longer a private affair; on the other hand the whole nation and its cultural heritage could effectively participate in its undertaking. The Mughal tomb owes much to the wealth and power of the Empire and to

38. Kramrisch, op. cit., Vol. I, p. 229.

39. Brown, op. cit., p. 90.

the relatively settled conditions, which always give the greatest impetus to the culture, art and crafts of a country. It owes a great deal also to the proverbial aesthetic nature of the Mughals and their love of art and architecture. They took keen personal interest in such building works and liberally patronised the artists and craftsmen.

TOMB OF MUHAMMAD GHAUS

The tomb of the famous Saint Muhammad Ghaus at Gwalior (Fig. 8) was built almost contemporaneously with the tomb of Humayun, though with different materials, using different techniques and forces of inspiration. It is a square building with 100 feet (30.48 metres) side. It has a single square mortuary hall 43 feet (13.11 metres) side which is covered by a dome resting on squinch arches. A lofty verandah 23 feet (7.01 metres) wide, apparently of a circumambulatory nature rotates round it. Exteriorly it 'is enclosed on all sides by large stone lattices of the most intricate and elaborate patterns.'[40] They have been panelled squarely, rectangularly and archedly and contain *jalies* (lattices of geometrical and floral designs). This is the first employment of the *jalies* on such a refined and large scale in a Mughal monument antedating a similar use in the tombs of Humayun and Salim Chishti. They seem to have been worked out by Gujarati artisans who were particularly conversant with their use and who produced magnificent works of this kind in the 15th and the early 16th century, under the patronage of the Ahmedshahi rulers. An extremely projecting *chhajja* protects them above on all sides. It is supported on typically Gujarati brackets. Brown aptly observes that this building embodied, 'the structure of the Lodi style with ornamental features derived from the architectural productions of Gujarat, a synthesis of the mode of the one and the treatment of the other

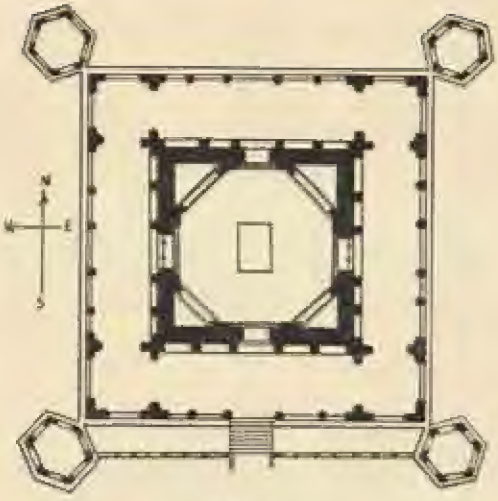


FIG. 8
Plan of tomb of Muhammad Ghaus at Gwalior

brought about by its geographical position.'[41]

This tomb has an attached hexagonal tower at each of its four corners. The tower itself is in three open storeys, the uppermost being a *chhatri* rising above the *chhajja*, and has a cupola roof. Four square *chhatris* with pyramidal roofs have also been attached, one in the centre of each external side of the tomb, supported on a square extension of the verandah. Four *chhatris* have also been provided above the mortuary chamber around the dome. These are very pleasing features and provide a rhythmic combination of solids and voids. The idea of corner towers and the attached *chhatris* disposed at regular intervals was later utilised in the tomb of Akbar at Agra on a far more refined and elaborate scale. There seems to be no doubt that this mausoleum played an important part in the evolution of Mughal sepulchral structures in later ages.

TOMB OF SALIM CHISHTI

The tomb of Salim Chishti at Fatehpur Sikri is square in plan (Fig. 9), measuring 48 feet (14.63 metres) side, with a beautiful porch attached to its southern side. It

40. Alexander Cunningham, *A.S.I. Report*, 1862-65, Vol. II (Simla, 1871), p. 369.

41. Cf. op. cit., p. 29.

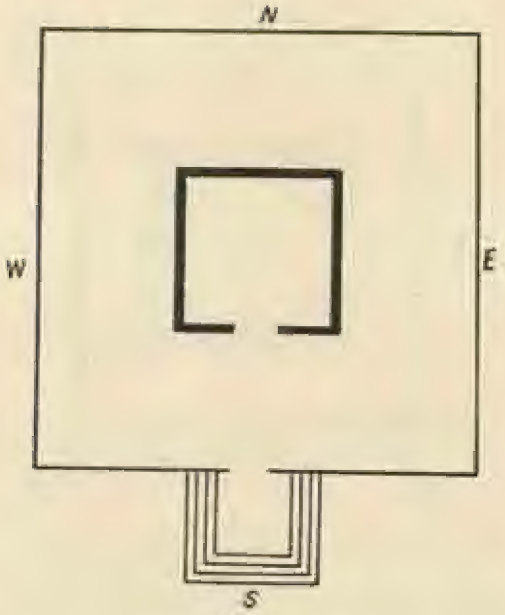


FIG. 9
Plan of the tomb of Salim Chishti at Fatehpur Sikri

has a mortuary chamber of 16 feet (4.88 metres) side, roofed by a suitable dome. It was built around A.D. 1581 and contains the grave of the Sufi saint Sheikh Salim Chishti who was held in high esteem by Akbar. The grave is enclosed within a pillared canopy of ebony, beautifully inlaid with mother-of-pearl, which is an exquisite piece of art. The chamber is surrounded on all sides with a spacious and airy verandah which is roofed compartmentally by corbelled slabs supported on pillars exteriorly, in the true Hindu style. Except for the entrance on the south side, the interspaces between the pillars are filled with exquisite latticed screens in beautiful geometrical designs. They produce an atmosphere of ethereal beauty inside the verandah which is more of a circumambulatory nature.

An extremely projecting *chhajja* rotates on all sides of the tomb, and is supported on gracefully designed struts of an unmistakable Gujarati origin. Each strut consists 'of a serpentine volute with the spaces between the curves filled in with perforated foliations' with a moulded pendent at the lower end and a half-*chakra* on the crown; it has 'more the appearance of carved ivory than chiselled marble.[42] The struts spring from about the middle of the shaft of each pillar, which is chevron-patterned and has a *kirtimukha* base and a stalactite capital. The struts have little structural value; Percy Brown, again, aptly notes that 'they are almost entirely decorative and produce an effect more fantastic than beautiful, suggesting the unrestrained imagination of the temple-builder rather than the rationality and reserve of Islam.'[43]

The provision of struts supporting the slanting *chhajja* is the most important characteristic of the tomb. It produces a beautiful shadow which is in wonderful harmony with the *jalies* of the circumambulatory path. There can be little doubt that this feature was introduced here by the artisans of Gujarat who commonly used it in Hindu and Jaina temples of the region.

The tomb owes its magnificent effect also to the pillared porch which introduces it to the visitor. Its varied outlines with vertical pillars, slanting struts and the horizontal lines of the *chhajja* give it an appearance of exquisite beauty, such as is only seen in Hindu temple-entrances. This feature also seems to have been introduced here by the temple-builders of Gujarat.

Except for the interior core the entire composition is in white marble which seems to have replaced the original fabric of red sandstone at a later date, probably during the last days of Jehangir's regime. The original shape and character however seems to have been retained unchanged.

AKBAR'S TOMB, SIKANDARA

Akbar himself planned his own tomb and selected a suitable site for it at Sikandara, a suburb of Agra, which was henceforth renamed Bihishtabad—the Heavenly Abode. To construct a tomb in one's own lifetime seems to be a curious phenomenon, though there could hardly be anything more realis-

42. Brown, op. cit., p. 98.
43. Ibid., p. 98.

tie. It was originally a Tartar custom which the Mughals faithfully followed. 'The princes of Tartar races in carrying out their love of tombs made it the practice to build their own in their lifetime, as all people must who are really desirous of sepulchral magnificence. . . . (they) built their sepulchres of such a character as to serve for places of enjoyment for themselves and their friends during their lifetime and only when they could enjoy them no longer they became the solemn resting places of their mortal remains. . . . During the lifetime of the founder, the central building is called a Barrah Durrie or festal hall, and is used as a place of recreation and feasting by him and his friends. . . . At his death its destination is changed—the founder's remains are interred beneath the central dome.'[44]

Garden of Akbar's Tomb The tomb stands in the centre of a vast garden which is enclosed by high walls on all sides. In the middle of each enclosing wall is a monumental gateway, the main

44. James Fergusson, *History of Indian and Eastern Architecture* (London, 1876), pp. 574-75; E. W. Smith, 'Akbar's Tomb Sikandarah,' *A.S.I. New Imperial Series*, Vol. XXXV, 1909, p. 4; Brown, op. cit., p. 89: 'It was customary for these monuments to be erected during the ruler's lifetime'.

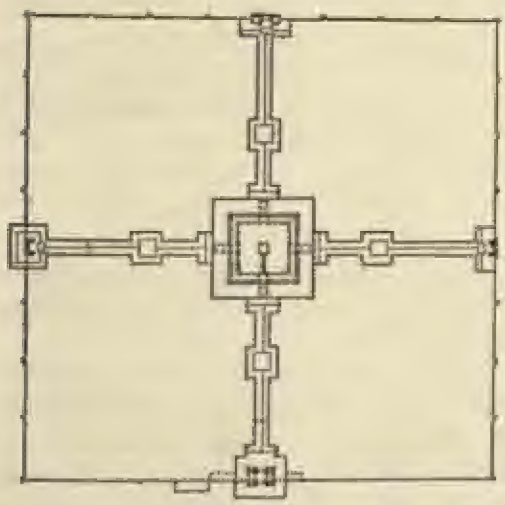


Fig. 10
Plan of the enclosure of Akbar's tomb at Sikandara

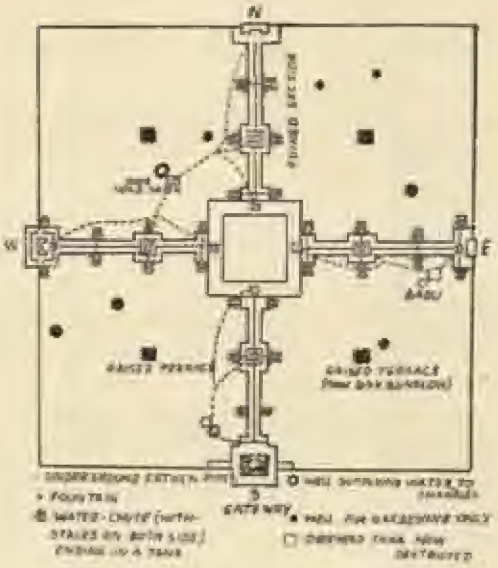


Fig. 11
Plan of garden of Akbar's tomb at Sikandara

gateway being on the south side, while the other three are false and ornamental only (Fig. 10). The tomb proper is connected with the four gateways by four causeways or terraces of 75 feet (22.86 metres) breadth, which thus divide the whole garden into four quarters according to the charbagh plan. Each high terrace or broad raised path has a narrow and shallow channel running in its centre (Fig. 11). The extraordinary height of the terrace facilitated the provision of the water-chutes or the *chadars* at regular intervals, with steps on both sides. The water descended below into lily ponds and then proceeded further into the water-courses which originally irrigated the garden. This demonstrates how passionately the Mughals loved waterfalls which they used as early as at the Rambagh in A.D. 1526 and as late as at Pinjore, about A.D. 1670.

Each terrace has a tank with a fountain in its centre. Four tanks have also been provided in the centre of the four sides of the main platform on which the mausoleum stands. They have also fountains, one each. These fountains were inlets, the outflow being provided in each case by the over-flowing of water into the channels.

Each quarter has a number of wells, some exclusively provided for gardening. Two huge wells, one in the south-west and the other in the north-west quarter, and a large stone *baoli* (step-well) in the south-east quarter were however reserved for supplying water to the fountains and the channels. Overhead tanks were built to ensure adequate pressure in the fountains; unfortunately only the set in the north-west quarter has survived. The fountains were fed by underground earthen pipes leading from these overhead tanks. Channels drew their water from the tanks and any scarcity of water was supplemented by the aqueduct from the big well near the main gateway. The *pur* method was employed here invariably instead of the *rehant* (Persian-wheel) of Fatehpur Sikri. The whole system worked efficiently and ensured a perfect supply of water to the platform and the terraces. The water was ultimately allowed to flow into the garden where it was used to irrigate the flower-beds and the avenues of fruit trees, which were the chief attraction of this garden.

As it appears today, the garden has been distinctly separated from the main water-courses. There are no cypress-avenues or flower-beds rising just above the flowing channels on the terrace; there are no fountains in the water canals. The architect obviously wanted to give the mausoleum a character full of reserved dignity and sobriety, thoughtfulness and quietitude, instead of delicacy and gaiety, a wizard's charm and splendour. It was intended to be an elegy in its true sense rather than anything else. It was in accordance with the personality of Akbar, one of the greatest rulers of India and the real founder of the Mughal dynasty, that the architect planned the garden and its water-devices.

The Gateways The northern gateway is in complete ruins. The assumption that it had never been finished is erroneous. The ruins adequately show that not only the structure had been completed, but also it had been stuccoed over and splendidly painted in a variety of designs. Distinct traces of mosaic and inlaid patterns have also survived and these demonstrate unmistakably that this gateway had been finished like the other structures of this grand project and it is at some later stage that it had been demolished, less by nature than by human agency.

The gateways on the east and west sides are almost identical, measuring 89′ × 47′ (27.13 × 14.33 metres) and are 80 feet (24.38 metres) in height; each has a central *iwan* flanked on either side by wings composed of two small arched alcoves, one over the other, and a beautiful *chhatri* above them all. Two miniature *chhatris* crown the pilasters which have been attached to the quoins of the facade. Both gateways are seven-storeyed and have a complex of square, semi-octagonal, octagonal and rectangular rooms and radiating and diagonal passages. They have been decorated tastefully with stucco and painting, mosaic and inlay and beautiful carving in which are depicted some of the typically Hindu motifs such as elephants with upturned trunks supporting a fringe of lotus-buds, peacocks with outspread tails, geese and other birds, lotus and *chakra* and other floral and conventional patterns. They are in relief as well as incised. Each gateway is a great monument in itself—complete and independent—and it is amazing to note that such superbly conceived and gracefully finished structures were only intended to serve a subsidiary role in the whole project! This demonstrates the greatly developed aesthetic sense of the Mughals; it represents how painstakingly they devoted themselves even to the smallest details of their creation.

Even these gateways recede into the background when compared with the south or the main gateway. It is in two storeys and measures 137′ 5″ (41.91 metres) from east to west, about 100 feet (30.48 metres) from north to south, and is 75 feet (22.86 metres) in height. Its north and south sides are

identical, each having a colossal *iwan* 61 feet (18.59 metres) in height and 44' 3" (13.48 metres) in width in the centre and two arched alcoves one over the other on its sides. The central portion rises well over the terrace and has two beautiful *chhatris*. The whole exterior has exquisite mosaic and inlay work in coloured stones, chiefly in geometrical patterns. The spandrels have particularly imposing arabesque scrolls. Carved inscriptions occupy the plane around the central arched entrance.

The gateway hall is octagonal and is about 42 feet (12.80 metres) in diameter and is 60 feet (18.29 metres) in height. Suites of rooms have been disposed on its east and west sides in two storeys. Persian inscriptions in relief ornament the frieze and part of the soffit which has otherwise been profusely painted.

Perhaps the most important feature of this gateway is the introduction of four beautiful minarets of white marble which rise from the corners of the terrace.[45] Each minaret is in four storeys, the fourth being the *chhatri* which crowns it majestically. Each minaret is circular and tapers as it rises. The lowest storey has curious flutings and similarly designed stalactites to support the balcony. The upper balconies on the other hand have bracket supports. The *chhatri* has been most appropriately and harmoniously designed.

The four minarets appear here for the first time. That their purpose was purely ornamental can scarcely be doubted. They occupy the angles of the gateway, which conventionally would have been filled with kiosks, and rise gracefully high into the sky seemingly carrying the whole body of the gateway with them. They stand predominantly and tower magnificently over their surroundings. Their appearance in such a fully developed state marks an important stage in Mughal architecture. The architect had now learnt how effectively he could

45. They were restored by Marshall on original lines between 1902 and 1909.

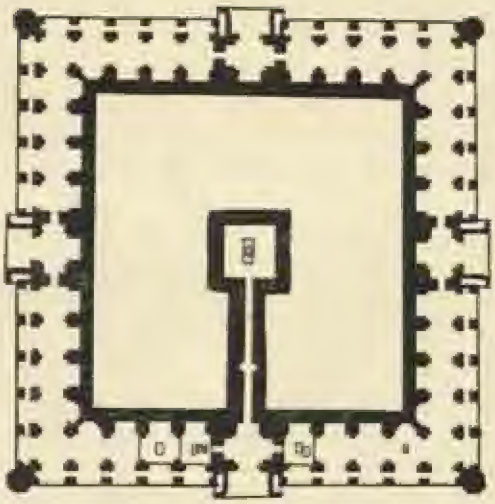


FIG. 12
Plan of the ground storey of Akbar's tomb at Sikandara

replace the attached towers of the main building with such minarets, as he did at the tomb of Jehangir. The idea was a great innovation and is representative of the innate genius of the Indian builder.

The Tomb Proper The main tomb has a unique design, unparalleled by any other building in the world. It is square in plan and is in five receding storeys. The ground floor has spacious cloisters on all the four sides except in the centre of the south side (Fig. 12). The cloisters are divided into numerous bays by massive piers and arches, each bay measuring 22 feet (6.71 metres) square. The centre of the south side is occupied by a vestibule which has very profusely been ornamented with encaustic painting and fine incised stucco in floral, conventionalized and inscriptional designs.[46] An inclined and descending passage, 105 feet (32.00 metres) long and 6 feet (1.83 metres) in width leads from this vestibule to the mortuary chamber which is a square of 40 feet (12.19 metres) side and is over 60 feet (18.29 metres) in height. It has been provided with four ventilators which open

46. Quranic texts in gold upon a rich blue background reproduce the whole of Chapter LXVII, verse 56 of XXXIII, and the last three verses of XXXVII.

onto the third storey. Originally it was also painted. The tombstone has been placed in the centre of this room. It is of brick and mortar.

Each facade of the main structure has a central *iwan* containing a colossal portal, the oblong panels around which have dense mosaic work. The pilasters at the quoins are surmounted by the pinnacles while the portal is superimposed above the parapet by an oblong 8-pilllared *chhatri* of white marble with a pyramidal roof. The two features combine together harmoniously. The semi-soffit of the portal has painting work on it. Double staircases have been provided on the sides of each portal. An octagonal tower is attached to each corner of the main building, surmounted by a massive broad 8-pillared *chhatri* with an imposing cupola roof and *kalasa* finial.

The second storey measures 182' 6" (55.62 metres) square and has an arcaded verandah on each side, composed of twenty-three bays (Fig. 13). Some bays break forward to support the third storey kiosks. The provision of the kiosks attached to each side exteriorly, almost in the same style in which they are employed at the tomb of Muhammad Ghaus at Gwalior, is its most important feature. It is apparent that the inspiration for these attached kiosks came from the Gwalior example. Of course, in this case the kiosks have been used far more elaborately, abundantly and with a far better perspective. The cluster of these kiosks engulfs the main body of the tomb most artistically. A better and a more detailed use of the *chhatri* could hardly be contemplated. Some have cupolas while others have pyramidal roofs of white marble. They harmonise well with the pillared arcade and produce a very pleasing effect. It is this feature which gives the tomb of Akbar its unique character.

The third storey again diminishes in size being only 103' 9" (31.62 metres) side (Fig. 14). It has similar arcades and cluster of kiosks on each side. In each of the four corners is a small room 9 feet (2.74 metres)

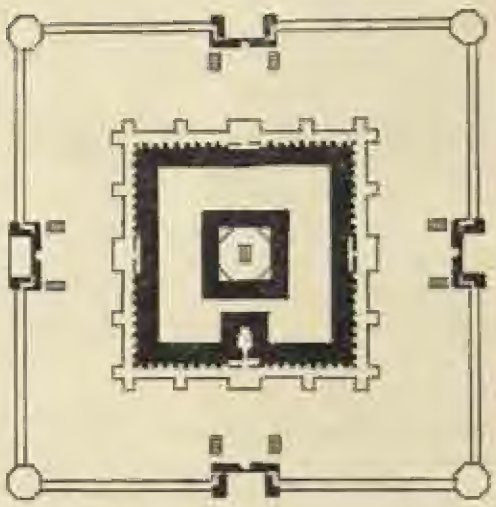


FIG. 13
Plan of the second storey of Akbar's tomb at Sikandara

square, to which no special purpose can be assigned. The fourth storey is still smaller, measuring only 89' 1" (27.16 metres) side, and with identical arrangement of arches supported on pillars and *chhatris* attached exteriorly to each facade (Fig. 15).

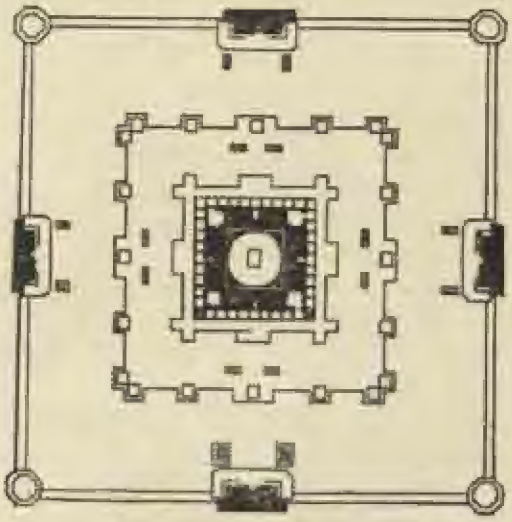
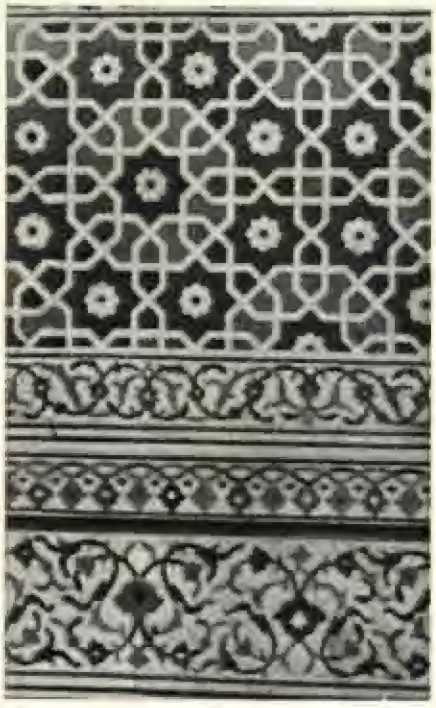


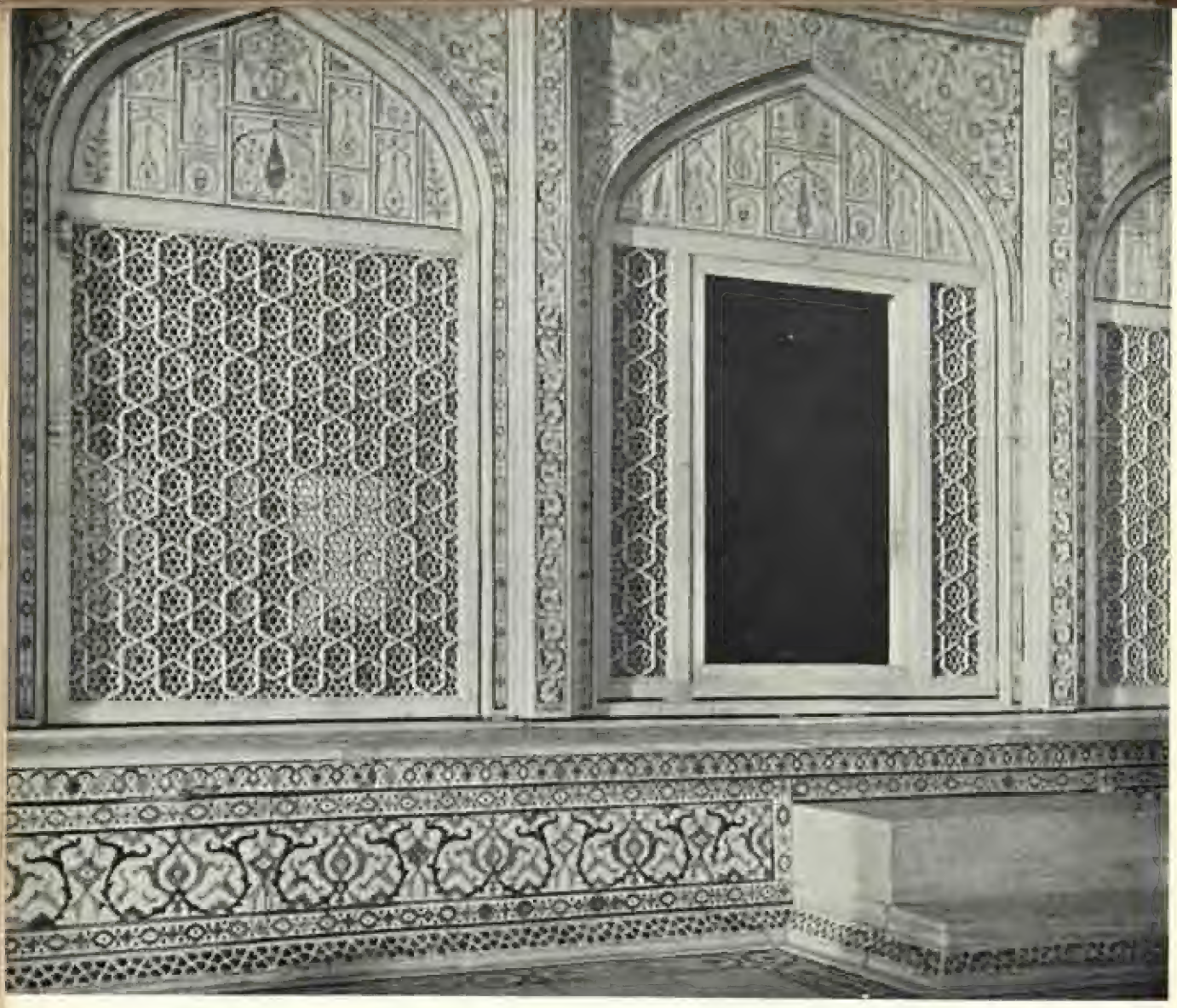
FIG. 14
Plan of the third storey of Akbar's tomb at Sikandara

A secret storey exists within the main body of the tomb on this floor (Fig. 16). It is accessible only through a small narrow window 6 feet (1.83 metres) high, above

16. *Mosaic and inlay. Tomb of Mirza Ghiyas Beg, Agra.*
(Copyright, A. L. Syed)



17. *Inlay work. Tomb of Mirza Ghiyas Beg, Agra.*
(Copyright, Archaeological Survey of India)



18. *Marble fretted windows and inlay work, Tomb of Mirza Ghiyas Beg, Agra.*
(Copyright, M. V. Vijayakar)

19. *Incised carving on the soffits and inlay work in the spandrels. Tomb of Mirza Ghiyas Beg, Agra.*

20. *Main gateway (South) of the Taj Mahal.*

21. *A revealing aerial view of the Taj Mahal.*

22. *An everlasting dream in gleaming marble...*
(Copyright, Priyalall & Sons, Agra)

23. (Overleaf). *A glittering gem in a beautiful setting.*

25. *The cadenzed harmony of grace and form.*
(Copyright, Priyalal & Sons, Agra).

24. (Previous Plate).
Eternal beauty petrified into stone.
(Copyright, M. V. Vijayakar)

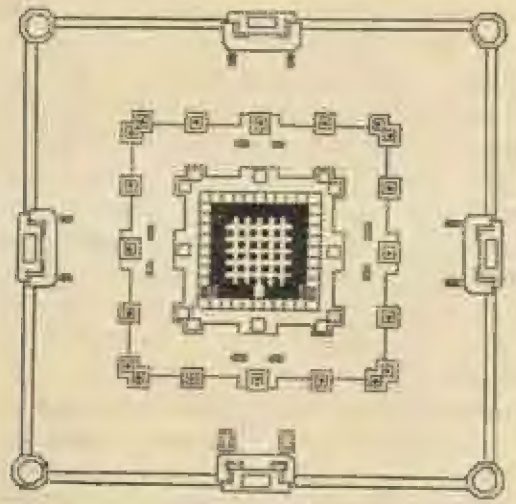


FIG. 15
Plan of the fourth storey of Akbar's tomb at Sikandara

the pavement of the verandah on the south side and it can be entered only by means of a ladder. Its interior is composed of five low and narrow corridors from east to west and an equal number of them running from north to south, bisecting each other at right angles. Massive piers support the huge stone beams. The ceiling is hardly 5' 6" (1.67 metres) high. The construction is curiously in brick and plaster. A tombstone in mortar and brick occupies the central space in the chamber. The purpose of this tombstone, laid in this unknown chamber so secretly, is yet to be ascertained.

The fifth and the topmost storey is entirely in white marble as against the lower storeys which are finished in red sandstone. It has a central square court 70 feet (21.34 metres) side which is open to the sky and which is surrounded by cloisters on all the four sides (Fig. 17). Each cloister measures 89' 1" (27.16 metres) exteriorly, being equal to the fourth storey. It is 9' (2.74 metres) wide and is divided into eleven bays on each side by slender piers and arches. There are thus forty bays altogether. Each bay has the Hindu trabeate ceiling, spanned with the help of diagonal slabs. The marble work seems to have originally been painted.

Each bay is enclosed on the outside by white marble trellis screens each having twelve monolithic panels. They have beautiful geometrical patterns in varied designs. The variety as well as the quality of the *jali* work is superior to that at the tomb of Muhammad Ghaus at Gwalior or that of the tomb of Salim Chishti at Fatehpur Sikri and marks a step forward in the development of this art which finally culminated at the tomb of Itmad-ud-Daulah and at the Taj Mahal.

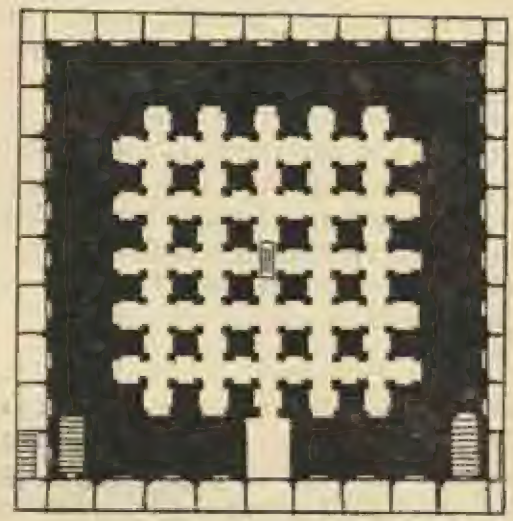


FIG. 16
Plan of the secret storey of Akbar's tomb at Sikandara

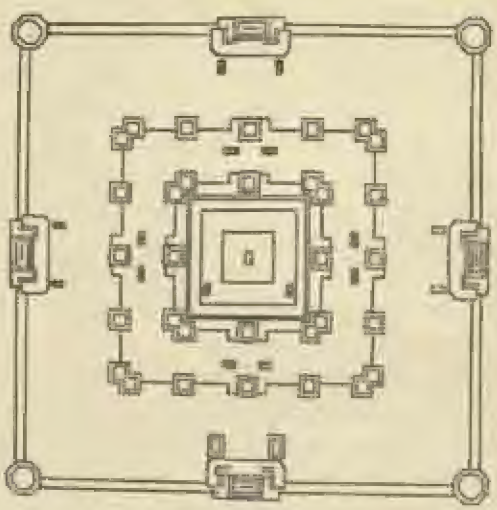


FIG. 17
Plan of the fifth storey of Akbar's tomb at Sikandara

The cloisters are protected above by a rotating *chhajja* and have a plain frieze. A slender square marble *chhatri* has been built at each corner above the cloisters. The central court has a square platform which has been bevelled to throw off the rain-water. A white marble monolithic cenotaph has been placed in its middle; it has been carved most profusely with floral, arabesque and conventional motifs, with 99 names of God on the top and sides, and *Allah-hu Akbar* and *Jalle Jalal-hu*, the customary mode of salutation in Akbar's Din-Ilahi, inscribed in opposite directions. Chinese cloud-forms appear in two cases. Butterflies have also been depicted liberally. At the head of the cenotaph, i.e., on its north side is an octagonal marble pedestal 2' 9" (0.84 metres) in height, resting on a square base. It has also been very profusely carved. It is generally believed to have held lamps on ceremonial nights.

A Secret Tombstone Akbar's tomb has thus three tombstones, one on the grave in the lowest mortuary chamber, and two cenotaphs, one each on the fourth and the fifth storey. The custom of providing cenotaphs or replicas seems to be an old one. Even the earliest Muslim tombs in India, e.g., that of Sultanghari and of Iltutmish have cenotaphs above the original graves. It may be traced as far back as the ancient Egyptian burial practices when one person could have two tombs, one for real burial and a cenotaph, situated not one over the other but at a long distance from each other, as are met with in the Mastaba tombs.[47] The Islamic theology adopted the custom in its own way. As is generally presumed, the real grave was made underground in which the dead person could wait till the Day of Resurrection. Greatest sanctity was attached to this grave and it was normally kept closed. A replica was provided on the ground level or near it for friends and relatives who come to offer *fatihas* and pray for the departed soul. A third could be provided on the uppermost storey, generally open to the sky, to keep it in contact with Heaven and in direct communion with the visiting Ferishtas (angels).

The tomb of Sadiq Khan is an earlier example at Agra where three tombstones have been provided one over the other, the true grave itself being in the crypt, a cenotaph in the main hall and another on the upper floor in the dome. The uppermost cenotaph is however not open to the sky, though it is open adequately on all sides to be accessible to the Ferishtas, as may be believed.

At the tomb of Akbar the functions greatly differ. The lowest tombstone is meant for visitors, friends and relatives and no attempt has been made by the architect to keep it secret or even closely guarded. The second tombstone on the other hand has been placed in a secretly devised storey and its existence was so far unknown to the Department of Archaeology itself. Obviously, it was not meant to be seen; the ingenuity with which it has been devised within the body of the structure and the great care and skill with which it has been closed on all sides indicate that it was not even meant to be known. What necessitated this extraordinary precaution is a matter of conjecture, as records are lamentably silent on this point. There could have been some curious, eccentric purpose for this secret cenotaph. It is probable that it was constructed by the artisans themselves without the supervision of Jehangir who was busy with the rebel Khusro and it was this that Jehangir later objected to, as he himself mentions, and as will be discussed later. However, while a secret underground mortuary chamber is a common feature of tombs, a secret storey on the fourth floor is an unparalleled phenomenon in the whole history of tomb construction in India.

The Design of the Tomb The design of the tomb is unique and is not met with in any

47. Fletcher, op. cit., p. 25.

of the earlier sepulchral structures (Fig. 18). It warrants a detailed investigation and an intensive study of the inspiration which brought about this extraordinary design.[48] Akbar himself planned and designed it and inaugurated its construction. But he died when only the lower storey of the main tomb was nearing completion and it was left to Jehangir to finish it. Jehangir, immediately after his accession, had to face an embarassing situation particularly created by the rebellion of his son Khusro. His most urgent concern was thus to settle the affairs of the Empire and to uproot defiant and rebellious nobles and a few years passed before he could pay any attention to his father's tomb.

Jehangir visited the mausoleum on Monday, the 17th Rajab 1017 AH (17th October 1608).[49] He records that he went on foot. When he saw the building which had been constructed over the grave of his father, he was not satisfied. It was not to his liking.[50] He narrates that 'while the work was in progress, in consequence of the rebellious conduct of the unfortunate Khusro, I was obliged to march towards Lahore. The builders had built it according to their own taste and had altered the original design at their discretion.'[51] This shows beyond doubt that the construction was not carried out according to the original plan and the masons had built as they liked. The original plan was not adhered to and it was this that Jehangir objected to. This might have happened because of the lack of supervision. Jehangir further records: 'The whole money had been thus expanded and the work had occupied three or four years. I ordered that clever architects, act-

48. This study was published in the form of a research paper in *Indica*, Vol. 4, No. 2, September 1967.
49. H. Blochmann, 'Akbar's Tomb at Sikandara,' *Proceedings of the Asiatic Society of Bengal*, 1874, p. 213; Hakim Maulvi Ali Ahmed, *Tuzuk Jahangiri Urdu* (Tonk, 1290 AH), p. 168; Marshall's equivalent (cf. *A.S.I. Annual Report* for the year 1904-5, p. 20) as Sunday, August 1608 is erroneous.
50. Blochmann: 'When I entered I saw no building over the tomb such as I would approve of' (p. 213); Wakiat (Elliot and Dowson, Vol. VI, p. 319): 'I did not find it to my liking'; Tuzuk (Beveridge), Vol. I (London, 1909), p. 152: 'It did not come up to my idea of what it ought to be....'
51. Elliot, p. 319; Beveridge, p. 152, 'the architects had built it after a design of their own'; Blochmann, p. 214, 'The architects in the meantime went on building after their taste.'

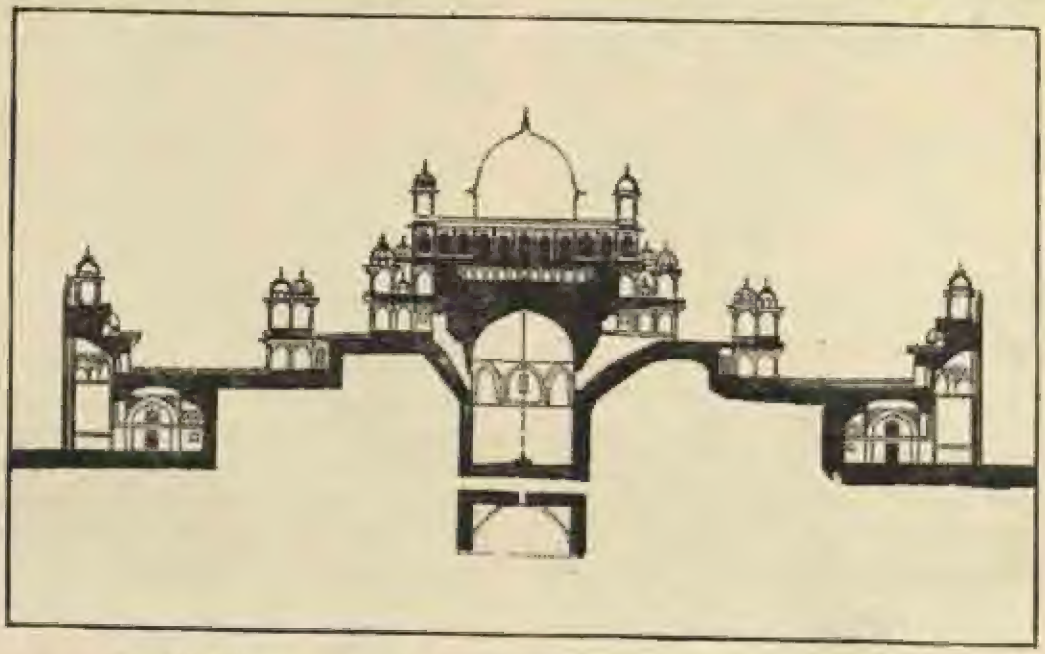


FIG. 18 *Elevation of Akbar's tomb at Sikandara with conjectural dome.*

ing in concert with some intelligent persons should put down the objectionable part which I pointed out."[52] Only those portions were disapproved by him and were subsequently ordered to be dismantled which were against or not in accordance with the provisions of the original design and which were constructed by the masons at their own sweet will. That the original plan of Akbar was substantially altered by Jehangir, as is generally supposed, has not been anywhere recorded. Instead, as appears from his Memoirs, he rigidly followed the original plan and directed only those parts to be rebuilt which had violated it.

Percy Brown held the view that only the ground or the foundational storey had been built during Akbar's reign and according to the original plan; the composition of the subsequent construction is light and fanciful and out of place; it lacks weight and firmness and probably it was 'rebuilt more in accordance with this monarch's (Jehangir's) architectural ideals."[53] Such architectural ideals Jehangir had none! He was a connoisseur of painting and loved gardens and wine. He was least interested in architecture. We do not come across any building of note bearing his brand. There is no doubt a marked difference between the spirit of construction of the ground storey which is extra strong, massive, heavily piered and sober and of the upper pavilion, which is light and delicate. But both parts of the structure unmistakably belong to the Akbari school. The ground storey, the exterior of which was also veneered with red sandstone originally is composed of broad arches and vaults supported on heavy extra strong piers. The construction is similar to that of the facade of the sanctuary of the Jami Masjid, Turkish Sultana's baths, and Hakim's baths at Fatehpur Sikri. The upper storeys are composed of arcades, supported on columns and beautiful *chhatris* with pyramidal or cupola roofs. This is a common mode of construction at Fatehpur Sikri; the arches resemble those of the colonnades of the Jami Masjid; the *chhatris* are typically Akbari. Simply because the strong character of the ground storey has not been maintained above is not a proof that the original plan had been altered by Jehangir. It seems more correct that the original plan was generally adhered to.

The uppermost storey has inscriptions of 'Allahu-Akbar' and 'Jalle-Jalalhu' which was the mode of salutation under Akbar's Din-Ilahi. The Persian inscriptions on the walls of this storey also harmonize with the religious views of Akbar. There is no mention of the Prophet as has foremostly been taught by Islam, '*La ilaha illallah Muhammad rasul-allah*.' Out of the 36 distichs, the first 23 are in praise of Akbar. The remaining are full of philosophical observations which are more akin to Vedantic monotheism. The last distich is most explicit in this respect and mentions, 'May his soul for ever rejoice in the Creator, May the world of holiness brighten through him."[54] The idea is not of the Islamic Day of Judgement but the Hindu conception of *nitya-atma* which is freed from all bondages of birth and death and rejoices with the Brahman eternally. These inscriptions are more representative of Akbar's views than those of Jehangir. So it seems that they were chosen by Akbar himself to be used in his mausoleum and the arrangement was not altered by Jehangir. It must be borne in mind that a supercession of Jehangir by his own son Khusro could be averted only with the support of the Ulemas, religious jurists and orthodox nobles, who were not satisfied with the

52. Elliot, pp. 319-20; Blochmann, p. 214; Beveridge, p. 152; Marshall, p. 20.
53. Cf. *Indian Architecture* (Islamic Period), pp. 107-8; Marshall (cf. op. cit., p. 20) maintained a similar opinion: 'It is just conceivable from this account that Akbar had started a building which Jehangir did not approve of and which the latter remodelled'; though he seems to hesitate and observes in the same paragraph: 'it is at any rate safe to say that the exterior of the buildings, if not their plan and foundations is the work of Jehangir.'

54. 'Dvanish hamesha zahaq shad bad,
azu alam qadas abad bad.'

liberal policy of Akbar. Though Jehangir was not bigoted, a definite change was marked after his accession; religious interception was felt more than ever in the Mughal court. The appearance of the svastika on the main gateway, not merely as a geometrical motif but certainly as an auspicious symbol on the entrance gate, the carving of elephant, lotus, *chakra*, peacock, geese and other traditionally Hindu motifs—all indicate the original scheme of decoration which was little altered by Jehangir. He no doubt added his own pet motifs—the wine-vase and Persian arabesque. A determined advance can no doubt be seen in the schemes of the architectural ornamentation—stucco, painting and mosaic. But as a whole the original plan and scheme were generally followed.

Akbar's tomb has an unconventional design. It is composed of tiers one over the other, to a total of five storeys, like the Assyrian Ziggurat or the earliest stepped pyramids.[55] It is so unlike the tombs of the Surs, the Lodis, or the Sayyids, who preferred to bury their royal personnel in an octagonal structure having three arches on each side and a rotating verandah, surmounted by a heavy massive dome. It is also not like the tomb of Humayun which is a square domed construction, with chamfered angles, having a central archway on each of its sides and four *chhatris* around the bulbous dome. Fergusson believed that its design had been borrowed from a Buddhist model.[56] He observes: 'It is a direct imitation of some such building as the old Buddhist Viharas.'[57] He compares its design with that of the Great Rath of Mahavellipore reproduced in his woodcut 66 and 181. But this idea does not seem to be based on a correct analysis of the facts. Except that both are composed of receding tiers of diminishing sizes, there is no essential similarity between the tomb of Akbar and the Great Rath of Mahavellipore. His observation that 'the number and proportions of the storeys is the same'[58] is erroneous. The Rath has four while Akbar's tomb has five storeys. The proportions also differ greatly: in the Great Rath the size of each successive tier diminishes uniformly while at the tomb of Akbar the size of the second storey is abruptly reduced in comparison to the ground floor and the fourth and fifth storeys are of equal size. Thus the measurements are as follows:

Ground storey	— 341 feet side (103.94 metres)	— 30 feet height (9.14 metres)
Second storey	— 182-6 (55.63 metres)	— 15 — (4.57 metres)
Third storey	— 103-9 (31.61 metres)	— 15 — (4.57 metres)
Fourth storey	— 89-1 (27.15 metres)	— 15 — (4.57 metres)
Fifth storey	— 89-1 (27.15 metres)	— 15 — (4.57 metres)

Making concessions for slight variations, the round figures which had originally guided the workmen will come to:

Ground storey	— 110 gaz side	— 10 gaz high
Second storey	— 60	— 5
Third storey	— 35	— 5
Fourth storey	— 30	— 5
Fifth storey	— 30	— 5

The open pillared *chhatris* of Akbar's tomb, which are distinctly attached to the main body, cannot be compared with the cells of the Great Rath; their prototype is at Fatehpur Sikri and at the tomb of Muhammad Ghaus at Gwalior. They can-

55. Its pyramidal form has been noted with great interest by the European travellers who came to Agra in the first half of the 17th century. Edward Terry (*A Voyage to East India* 1615-18, reprint from the edition of 1655, p. 291) remarks, 'this most sumptuous pile of all the structures' is 'built high like a pyramid.' In Peter Mundy's opinion, cf. *Travels of Peter Mundy* (R. C. Temple, 1914, Vol. II, pp. 210-11), who saw it in 1631, its 'outward frame resembleth the mauseolo pictured among the seven wonders fower square lesseninge towards the topp havinge several galleries round about.... theis galleries ascendings one from another to the topp on which is a square little court.' The drawing on his Plate 14 however misrepresents Akbar's tomb and seems to have been prepared later only from a vague memory of the outlines. It is shown herein almost like a ziggurat uniformly receding stage by stage which is not the case, as will be shown later.

56. Cf. *History of Indian and Eastern Architecture* (London, 1876), p. 583.
57. Ibid., p. 584.
58. Ibid., p. 585.

not directly be associated with those purely decorative features of a trabeate order.

The design of the tomb of Akbar can be better compared with the Vaikuntha Perumal Temple at Coonjeeveram (Kanchipuram). This is in five storeys and the tiers in this case also do not recede uniformly. The contours resemble. The temple has a domed superstructure which could have stood comparison with the proposed dome of Akbar's tomb. But it is merely co-accidental that the two are so alike in appearance. As a matter of fact, the architect of Akbar never derived any inspiration from the Vaikuntha Perumal *prasada*. Instead, as it appears more probable, the inspiration of its design was taken from the tomb of Humayun, the tomb of Muhammad Ghaus and the Panch Mahal at Fatehpur Sikri. The tomb of Humayun rests on an arcaded plinth 22 feet (6.71 metres) in height, and has an arched portal in the centre of each of its sides; these two features have been incorporated judiciously on a different scale in Akbar's tomb: here the arcaded ground floor has a stupendous arched portal in the centre of each of its sides, duly surmounted by an eight-pillared oblong *chhatri* which had been very commonly used by Akbar at Fatehpur Sikri and which here proved to be a very suitable addition. An attached tower appears on each of its angles, surmounted by a voluminous eight-pillared *chhatri* with a beautiful cupola. It was an innovation as beautiful and impressive as was the introduction of the four monumental minarets over its southern gateway.

The foundational storey is thus merely a plinth to give a grand elevation to the upper structure. It is 22 feet (6.71 metres) high at the tomb of Humayun, but here it has been raised to a height of 30 feet (9.14 metres) and other details have also been greatly enlarged. This accounts for the change of spirit in the construction of the ground storey and the superstructure over it. Had a dome crowned the superstructure the two would have distinctly been co-ordinated: the ground storey would then have served as the plinth or the base of the main domed tomb composed of four storeys.

These upper storeys were inspired by the Panch Mahal which is a tiered building of five storeys.[59] Instead of its beam-and-bracket system, here at Akbar's tomb the arches of the Jami Masjid have been imitated on a reduced scale. They have been supported on columns. The attached *chhatris* were without doubt inspired by the tomb of Muhammad Ghaus; here they have most rhythmically been disposed at regular intervals on each storey. One feature accommodates the other harmoniously and pleasingly; the combined effect works wonders on the aesthetic sense.

A Proposed Dome The uppermost or the fifth storey of the tomb appears to be incomplete as it has no dome like that of Humayun's tomb or even a pavilion with a pyramidal roof like that of the tomb of Itmad-ud-Daulah. This storey, which is all of white marble, has four square *chhatris* at its angles and a raised platform in the centre of the open courtyard. A profusely carved cenotaph and a pedestal have been placed on this platform. J. P. Thompson while considering the possibility of an upper pavilion over the tomb of Jehangir at Shahdara in Lahore supposes that the upper cenotaph at the tomb of Akbar was deliberately left exposed to the sky.[60] The building was thus considered to be complete without a dome. Though Thompson admitted that the platform is supported on massive piers and arches, he maintained that Jehangir lived for another fifteen years and could have hardly left it incomplete.[61] He further observed that Jehangir took the idea of an exposed cenotaph from his

59. E. B. Havell, held a similar view. Cf. *Indian Architecture* (London, 1913), p. 176.
60. Cf. 'The Tomb of the Emperor Jehangir,' *Memoirs of the Asiatic Society of Bengal*, Vol. V, No. 4, Part I (Calcutta, 1916), p. 29.
61. Ibid., p. 29.

father's tomb who had desired that his own should be left open to the sky.[62] Syed Muhammad Latif agrees with Thompson and on the support of a note in *Amal-i-Salih* of Muhammad Salih Kambo, concurs that Jehangir in pursuance of the Sunni faith and following the example of his ancestor Babur had desired that his tomb should be erected in the open air so that rain and the dew of heaven might fall on it.[63]

Babur's body was 'laid in the garden of his choice in a grave open to the sky with no building over it, no need of a doorkeeper.'[64] This was done in accordance with his will[65] which seems to have been inspired more by his love of nature and open air rather than an apprehension of the Day of Resurrection. W. H. Nicholls conducted intensive researches at the tomb of Jehangir and on the support of 'the structural evidence which came to light after the removal of the modern skylight' concluded that there was a domed chamber on the terrace platform of the tomb of Jehangir.[66] He observes, 'there can be no doubt that the building as it stands today is incomplete and that there was some structure upon the raised platform in the centre of the flat roof.... There are no indications to warrant the traditional domed structure or pavilion surmounting the raised platform.'[67] He completely refutes the theory that the tomb of Jehangir was left open to the sky: 'the structural evidence strongly indicates that the vault had no hole in its crown originally.... From the broken edge of the brickwork it was at once clear that the opening had not been part of the original construction but that it had been subsequently formed by hacking through the brickwork of the vault.... At all events the pietra dura in the vaulted chamber bears little evidence of having been exposed to storm and rain.'[68] Percy Brown also maintains that there was a marble pavilion on the roof originally.[69]

The view that the upper cenotaph at the tomb of Akbar was deliberately left exposed to the sky is hardly convincing. Akbar did not desire that his tomb should be left open in this way. And if he had expressed any such wish, it was not obeyed as the real grave is in the mortuary chamber or the crypt in the ground floor with a solid ceiling over it and it is only a cenotaph, or the replica of the real tomb, that has been left open on the fifth storey. Akbar did not care much for the Sunni tenets; he wore gorgeous clothes; sometimes drank, encouraged animate sculpture and painting, instituted *Jharokha-darshan*, *Tula-dan* and *Tilak*—and did all these things, so much against the Canon Law. That he wanted to be a truer mussalman after his death than he was in his life is not acceptable.

We have evidence, historical and architectural, which convinces us that a suitable superstructure was part of the original plan. William Finch, who was at Agra between A.D. 1608 and 1611 remarked that there was a 'rich tent with the Semaine over the tomb. But it is to be inarched over the most curious white and speckled marble and to be seeled all within with pure gold richly inwrought.'[70] The topmost storey was not intended to be left open to the sky. Fergusson justly held the view that a domical chamber was part of the original design. He observes: 'No such royal tomb remains exposed to the air in any Indian mausoleum; the raised platform in the centre of the upper cloister 38' square looks so like its foundation that I cannot help believing

62. Ibid., p. 22.
63. Cf. *Lahore* (Lahore, 1892), p. 107.
64. *Baburnama* (Beveridge), Vol. II, p. 709.
65. Ibid., p. 709; also see Appendix—V, p. LXXX.
66. Cf. *A.S.I. Annual Report*, 1906-7, p. 14.
67. Ibid., p. 12.
68. Ibid., pp. 12-13.
69. Cf. op. cit., p. 100.
70. William Foster, *Early Travels in India* (London, 1921), p. 187; Purchas, his *Pilgrims*, Vol. I, p. 440; Finch observes that by the time of his departure (in 1611) the cenotaph was not finished and 'lay in the manner of a coffin covered with a white sheet interwrought with gold flowers.' (Cf. Foster, pp. 186-87).

it was intended for this purpose. As the monument now stands the pyramid had a truncated and unmeaning aspect. The total height of the building now is a little more than 100' to the top of the angle pavilions; and a central dome 30 or 40 feet higher which is the proportion that the base gives, seems just what is wanted to make this tomb as beautiful in outline and proportion as it is in detail."[71] E. B. Havell held a similar opinion: 'Such a canopy is just what is required by aesthetic considerations to complete the curiously truncated appearance of the top storey. . . .'[72] He was positively sure of such a 'traditional domed canopy on the top storey' which 'was either omitted by Jehangir who was not pleased with the original design or it has fallen into ruin.'[73] The central dome had also been omitted on the Diwan-i-Khas at Fatehpur Sikri where 'the vaulted roof constructed with stone ribs took the place of the customary dome so as to provide for a terraced promenade over it. According to the strict Hindu tradition, the roof should have had its "five-jewel" domes: the absence of the central dome in this instance [at Akbar's tomb, Sikandara] makes the four kiosks at the corners seem too large for the building.'[74]

The dome was a logical necessity to provide a suitable apex to the pyramidal elevation and also to protect the exquisite carving work of the cenotaph and the pedestal. The building as it presently stands appears to be incomplete; something is lamentably lacking and the eye searches longingly for that 'something' over the fifth storey. If a dome is substituted, it would magnificently fill this vacuum and give the building a complete and a far more beautiful appearance. E. W. Smith arrived at the same conclusion after careful examination.[75] In his opinion the platform was designed to support a chamber crowned by a light dome 'The side of this chamber would have probably been composed of trellis-screens set between piers after the style of those forming the sides of the room surmounting Itmad-ud-Daulah's tomb which was built a little later than Akbar's tomb.'[76] The platform is supported on extra strong massive piers and huge stone boulders in the secret storey which could have adequately supported such a dome. As it stands the platform appears to be superfluous as there seems to be no sense in providing such additional and extraordinary strength to the piers unless a dome was intended to be built subsequently and a load was expected to rest over them. A light platform would need no extra support. A comparison between plates 9A and 9B would show that the building is incomplete as at present and its overall aesthetic effect —the true quality of an architecture—is enhanced if a suitable dome is placed over the fifth storey platform. It seems all the more necessary from the point of view of providing a suitable superstructure in which could gracefully culminate the pyramidal effect of the whole building. It is also desirable in order to counteract the upward trend of the central portals; the arches together can only be presented impressively if superimposed by a dome. Besides it does not seem logical that the exquisite carving work of the cenotaph and the pedestal which was intended for standing burning lamps or candles could be left open to the sky—quite at the mercy of dust, heat, air, the sun and rain of Agra!

Why such a dome, if it really formed part of the original plan, could not be or was

71. Fergusson, op.cit., p. 385; his woodcut No. 334 shows the section of the tomb with a dome; the illustration faithfully represents the truth in his statement.
72. Cf. *A Handbook to Agra* (Calcutta, 1912), p. 100.
73. Cf. *Indian Architecture: Its Psychology, Structure and History* (London, 1913), p. 176.
74. Ibid., p. 170.
75. Cf. 'Akbar's Tomb Sikandarah,' *A.S.I., N.I.S.*, Vol. XXXV (Allahabad, 1909), p. 14.
76. Ibid., p. 14; his Plate IX shows the section with a conjectural dome.

not built is only a matter of conjecture. Some constructional difficulty might have arisen in the long run and the idea had to be given up. May be, the cloisters of the fifth storey with its exquisite lattice-work had been built by the masons before the construction of the central dome could mature and when Jehangir noticed this, it might not have been considered worthwhile to demolish a side of it to facilitate the central construction. No doubt, as Jehangir records and as has already been mentioned, the architects built according to their own taste before Jehangir could direct them. Or, there is a great probability that the proposed dome was finally considered to be superfluous and the idea was dropped. As Thompson observes, Jehangir lived for another fifteen years and could not have left the tomb of his august father incomplete unless there were convincing reasons for doing so. Some other facts need to be borne in mind: that Jehangir generally resided outside Agra either in camps near the sites of his military campaigns, for example, at Mewar and Deccan or at Lahore and in Kashmir for personal reasons; that after his marriage with Nur-Jehan in A.D. 1611 he completely gave himself up to her; the period that followed is noted for her ascendency in the court and it may also be surmised that Nur-Jehan for one reason or the other chose to leave the tomb as it presently stands. Whatever the reason may be, a dome is a logical and architectural necessity and would have given this tomb a more complete and a more perfect appearance.

The tomb of Akbar is a great monument; it is undoubtedly one of the greatest masterpieces of the Grand Mughals. With its four minarets, its beautiful garden setting, the most graceful disposal of *chhatris* with cupolas and pyramidal roofs on the superstructure and their harmonious correspondence with the arcades, the beautiful colour schemes on the exterior as well as in the interior in a wide variety of patterns, this gigantic mausoleum marks an important stage in the development of the tomb in India.

That Percy Brown maintained a different view is simply unfortunate. He observes: 'Akbar's mausoleum is an architectural retrogression.... [it] is deficient in the essentials of coherence and mass.... although a superb effort the result is architecturally ineffective as it lacks substance and volume as well as the qualities of unity and definition.'[77] Percy Brown made an extensive study of the various schools of Indian architecture from the earliest times to practically the 19th century, spread over such a vast country as India from Kashmir to Kanyakumari and from Saurashtra to Bengal. He is therefore not to be blamed; his scholarship is not to be doubted. It was not probable or practicable for him to go into the deeper details with an intensive approach to such delicate issues pertaining to individual structures. Evidently he was misled by the extraordinary height of the ground floor which was to serve only as the plinth of the main tomb. Greater deception was created by the vacuum over the superstructure which could have been reconciled by a dome. No doubt, the architect aimed at producing an original composition, but it was not intended to depart from the conventional domed structure. Instead, he wished to utilize indigenous architectural inspiration to the fullest extent to present this tomb in a way which would be befitting to the fame of the person whose remains it enshrines. The attempt could never have failed in Brown's estimation to bring about a homogeneous, unified and coherent creation, had only the plan to construct a dome over it matured. Jehangir cannot be blamed for its defects, just as he cannot be credited for its merits. He seems to have simply carried out the plan which undoubtedly originated and was finalised during his august father's lifetime.

77. Cf. op.cit., p. 99-100.

TOMB OF MIRZA GHIYAS BEG

The tomb of Mirza Ghiyas Beg, entitled Itmad-ud-Daulah,[78] was constructed by his daughter Nur-Jehan between A.D. 1622 and 1926 on the left bank of the river Jamuna at Agra. The garden of the tomb of Itmad-ud-Daulah has also been laid out on the char-bagh plan, the mausoleum occupying the centre as usual (Fig. 19). It marks the stage where the architect, the landscape gardener and the water-expert co-operated most successfully and worked out a perfectly unified composition. Of course, the small area of the undertaking must have greatly facilitated their work. The smaller dimensions allowed the plan to be simplified and refined. The water was drawn by *purs* from the two wells situated on the riverside on the north and south respectively. Each branch had an overhead tank above and a storage well below. Each overhead tank supplied water to the two fountains of the tanks on the plinth of the mausoleum on its respective side, through underground earthen pipes. Pipes measure 6" (0.15 metres) in diameter and are glazed inside. They are sunk 2 feet (0.61 metres) below the garden level.

The storage wells supplied water to the shallow water-channel, which runs on all sides of the garden as well as around the mausoleum. Sunk in the middle of the

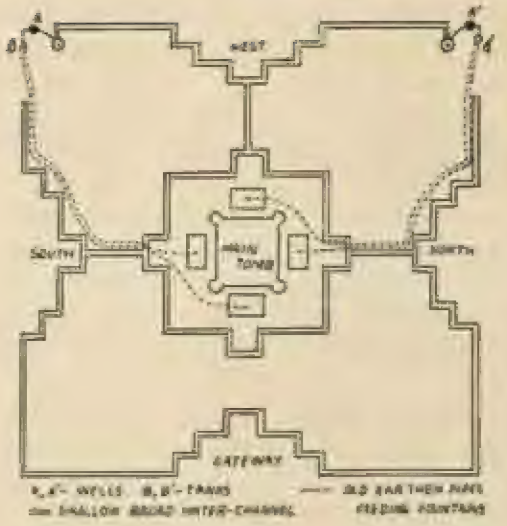


FIG. 19
Plan of the garden and tomb of Mirza Ghiyas Beg at Agra

raised stone-paved pathways and associated harmoniously with lotus-ponds and water-chutes, this extremely shallow channel proves to be a very befitting element of the whole garden composition. The pathways are only slightly raised from the parterres which helps to maintain unity as well as the harmony of the tomb-garden. The parterres could conveniently be converted into symmetrical flower-beds full of roses, tulips, iris and other flowers of typical Persian brand. Space for larger plants and fruit trees was allotted adjoining the enclosing walls, leaving the mausoleum fully open to view from all angles. It is surprising and equally commendatory that no separate arrangement was made to irrigate the garden; water which over-flowed the channels automatically irrigated the flower-beds and the tree-belts. This shows the lucid ingenuity of the garden-planner on the one hand, who could associate gardening with the water-devices so inseparably, and the architect on the other who utilised both these features for the enhancement of beauty of his architectural creation.

The main entrance, which is on the west in the tomb of Humayun and on the south in the tomb of Akbar, is on the east side in

78. Abul Fazl, cf. *Ain-i-Akbari*, Vol. I (Blochmann) (Calcutta, 1873), pp. 508-9, introduces Mirza Ghiyas Beg as son of Khwaja Muhammad Sharif who was Vazir of Khurasan and then of Yazd. After his father's death, due to political turmoil he fled from Persia and came to India and was introduced to Akbar by Malik Masud. He was an able man and rose high by the sheer dint of his merits. Akbar promoted him to a mansab of 1000 and appointed him Diwan-i-Buyutat. After the marriage of his daughter with Jehangir in A. D. 1611 he was made commander of 6000 *zat* and 3000 *sawar* as the later chronicles including the Memoirs of the Emperor record. He held the title of Itmat-ud-Daulah or the Lord Treasurer of the Empire. *Tuzuk-i-Jahangiri* mentions his death in 1031 A.H. (A.D. 1622) three months and 20 days after the death of his wife Asmat Begum whom he dearly loved.

this tomb. This directional change seems to have been conditioned by its situation on the riverside. False gateways, which may be appropriately called water-pavilions, have been constructed on the north and south. The west side has in its middle a multi-storeyed and multi-apartmental pavilion. It overhangs the river and is so open and abundantly airy that it could have served the purpose of a pleasure pavilion.

The white marble tomb stands on a plinth of red sandstone, having in the centre of each side, opposite the central arch, a tank with fountain. It is square in plan, with octagonal towers attached to the corners. These towers attain a circular form above the terrace and are surmounted by circular *chhatris*, which have been peculiarly designed and lack proportion. The Persian element is distinctly perceptible in this tomb, and it seems as if a definite attempt has been made here to Persianize this essentially Indian feature. The effect has been saved from disaster by the use of a lower *chhajja* supported on beautiful brackets and by the lotus-petals and *kalasa* finials over the cupolas.

The tomb has three arches on each of its four sides, the central one being the entrance; the other two on the sides are closed with beautiful perforated screens.

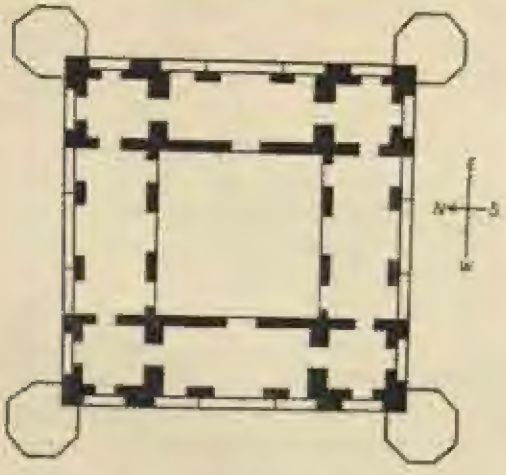


FIG. 20
Plan of the Chauburj

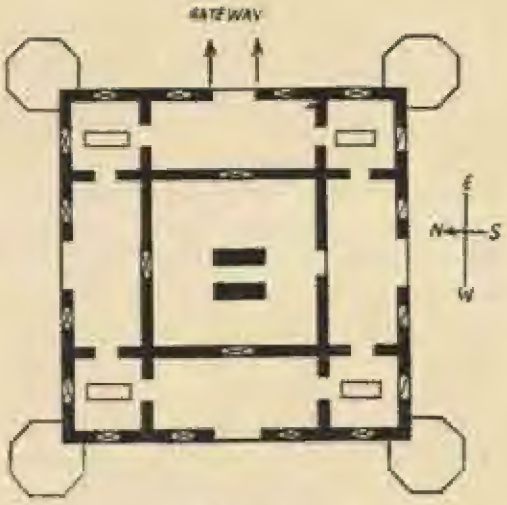


FIG. 21
Plan of the tomb of Mirza Ghiyas Beg at Agra

Each side is protected above by a *chajja* and a *jalied* (fretted) balustrade. The *chajja* is supported again on very imposing brackets, which along with the balustrade produce an exceedingly charming play of light and shade. There is nothing particular in the interior arrangement of the lower storey, the plan having been borrowed evidently from the Chauburj, an earlier construction situated some few hundred yards to the east of it (Figs. 20 and 21). The upper pavilion however is unique as it does not have a conventional dome but has instead a pyramidal roof crowned by a huge *padma-kosa* and four *kalasa* finials at the four angles. It is square and has three arched openings in each side which are closed, except for those in the centre of the north and south sides, by screens of the finest marble tracery. 'Cornices on brackets and a wide eave to the upper portion provide horizontal lines and shadows emphasizing the sense of quiet peacefulness which pervades the conception as a whole.'[79] The floor has a beautiful pattern of coloured and rare stones in mosaic with two yellow porphery cenotaphs.

The whole exterior of the tomb is in white marble with very profuse ornamentation in mosaic and inlaid patterns. It is the deco-

79. Brown, op.cit., p. 101.

rative aspect which appears to predominate in this tomb; it is the mosaic of coloured stones which attracts the eye at first glance; the architect seems to have provided only the surfaces for the inlayer and the mosaicist to work upon, having all the time the ornamentation in view. The profuse colour embellishment easily leads one to presuppose that the decorative values have superseded the structure at the tomb of Itmad-ud-Daulah. But although elaborately ornamented, as a matter of fact, as Brown aptly comments, 'the embellishment throughout has been carefully subordinated to the architectural effects, there is little relief work, most of the surface being delicately coloured by means of inlaid stones. The result of such treatment is that any undue brilliance of the white marble is subdued by the subtle tints of the inlay which spins its fine filaments over every portion, often in painted patterns, only excelled by those of a butterfly's wing.'[80]

The tomb of Itmad-ud-Daulah marks the stage of transition from red sandstone to white marble and consequent to this a revolutionary change in all aesthetic norms. The ornamentation is chiefly in mosaic and inlay, the associated form of decoration on marble surfaces. Carving has been used on a very small scale. Beautiful jali-work can be seen in the screens. Particularly noticeable are the carved soffits of the arches on all sides. The art resembles the best ivory work. A floral design has been associated with the stalactite, both of unmistakable Persian origin. The delicacy and grace of the incised work demonstrates the skill of the Indian carver who could use his stone almost like wax or ivory. The extremely delicate design must have been inspired by some needlework, probably some Persian embroidery, but it was only in the hands of the Indian artisan that it could so faithfully be reproduced on stone. It is one of the best examples of carving on marble and the best in its own class.

80. Ibid., p. 101.

With the adoption of white marble as the constructional material, new aesthetic values came into force. Norms of architecture changed, and the structural and decorative forms were diverted into new channels. The architect learnt here at the tomb of Itmad-ud-Daulah that ornamentation on marble surface has to be very judiciously applied with adequately large plain surfaces, otherwise it tends to become confused and ineffective. Bold geometrical motifs and densely spread conventionalized patterns were used successfully on red sandstone. But neither of these is suitable for use on white marble, which for a really aesthetic presentation requires delicate floral designs in subtle varied tints, executed exquisitely with the precision of a jeweller, with large plain undecorated surfaces for emphasis. The adoption of white marble as the chief building material consequently brought about a revolutionary change in the style of architectural decoration.

Many Persian motifs, such as wine-vases, cups and dishes, the cypress and narcissus, have been freely depicted at this tomb. They are representative of the mounting Persian influence on the Mughal court, subsequent to the marriage of Nur Jehan with Jehangir.

Though this is a small tomb in comparison to some of the earlier examples, it occupies an important place in the evolution of Mughal sepulchral monuments. It fully justifies the proverbial saying that the Mughals began like Titans and finished like jewellers. 'Surrounded by a formal scheme of lawns, parterres, flagged pathways, tanks and fountains' which the architect devised, 'the tomb building in flawless white marble reposes like a gem within its casket' which the jeweller-artist finished.

The real graves seem to have once rested in the underground crypt accessible from the riverside. It has now been completely blocked. The ground floor mortuary chamber and the upper pavilion contain the cenotaphs of Asmat Begum, mother of Nur Jehan, and of Mirza Ghiyas, one set of each

(Figs. 22 and 23). The cenotaphs in each case have been placed irregularly. Thus, while the sarcophagus of Asmat Begum is in the exact centre of the hall on the ground floor as well as in the upper storey, that of Mirza Ghiyas occupies an unsymmetrical position to its right. The square cenotaph chamber on the ground floor measures 22' 2" (6.76 metres) side and the cenotaph of Asmat Begum is at a distance of 9' 9" (2.97 metres) from the eastern wall, while the cenotaph of Mirza Ghiyas is only 7' (2.13 metres) from the western wall. The distances in the upper hall are 11' 1" (3.35 metres) and 8' 4" (2.54 metres) respectively. This is an important point in the sense that it is not easily noticeable at the tomb of Itmad-ud-Daulah as the cenotaphs here are not enclosed within a screen, while at the Taj Mahal the passage within the enclosing fretted screen is practically obstructed by the cenotaph of Shah Jehan and thus immediately attracts one's attention. In both cases the wife preceded the husband to her heavenly abode, and in both places she lies buried in the exact centre. The bodies according to Islamic law are buried with their faces towards Mecca and the legs towards the south, and the husband is placed on the right hand of his wife.

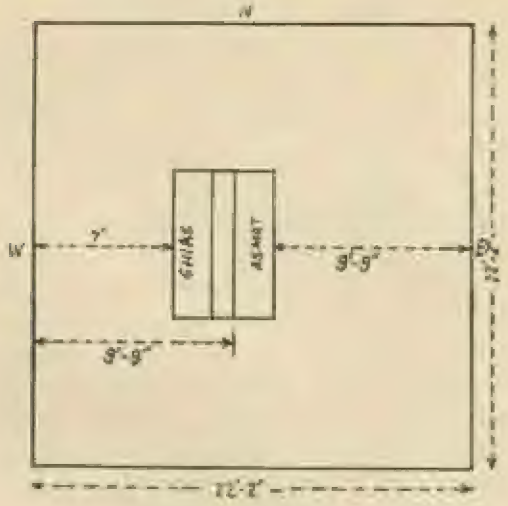


FIG. 22
Plan of cenotaph chamber on the ground storey of the tomb of Mirza Ghiyas Beg at Agra

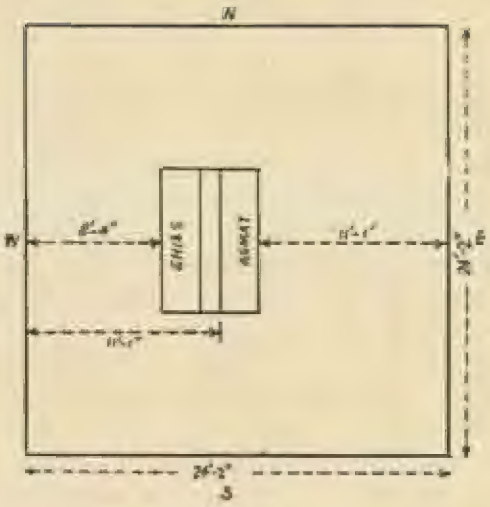


FIG. 23
Plan of cenotaph chamber of the upper pavilion of the tomb of Mirza Ghiyas Beg at Agra

In the tomb of Itmad-ud-Daulah the towers have distinctly and unmistakably been attached to the angles at ground level. Those at the tomb of Jehangir occupy a far more dominant position in the whole conception as they rise four storeys above the main building, but they are still attached to the main structure. The stage was then ready to detach and place them suitably at the corners of the plinth as has been planned at the Taj Mahal.

THE TOMB OF JEHANGIR, LAHORE

Jehangir, like his great-grandfather Babur, greatly loved natural beauty. He loved flowers and their soothing colourfulness developed in him an appreciation of painting with such floral motifs. Many gardens which rank among the best during the whole span of Indian history owe their origin to Jehangir's reign. Particular mention may be made of the Nishat and the Shalimar of Kashmir and the Dilkusha Bagh at Lahore. He spent most of the later period of his life at the garden pavilions of Lahore and Kashmir and it was on his way back to Lahore from there that he died.

It seems he gave special attention to the Dilkusha Bagh, or the Garden of Delight

popularly known as Shahdara, across the Ravi at Lahore, where he intended to have his tomb constructed. It is one of the largest gardens in India, and is also an elaborate version of the char-bagh plan. The immense area is square and is enclosed on all sides by high walls with a gateway in the middle of each side. The garden is divided into 16 equal square parterres, each separated from the other by means of paved causeways, with a lily-pond and a fountain at each intersection. The mausoleum is thus surrounded on all sides by a series of raised fountain-tanks, with water-chutes, water cascades and water-channels, all bordered by long cypress avenues and flower-beds. Sometimes separate plots were allotted to a single flower, like tulips, violets, roses, poppies, lilies, anemones and red cyclamen. The great flower worshipper that Jehangir was, the landscape gardener in this way paid a high tribute to the soul of his departed Lord, as did the architect by representing the same flowers in inlay in all the mural decorations of his tomb. The flash and sparkle of water rippling poetically from the water-chutes running through the channels gives this tomb-garden a charm which would certainly have delighted Jehangir in his life. The deep unending shadows of the cypresses in the symmetrically laid avenues and the rose bushes and other flowers in different parterres bordering the raised walks, provide a most colourful setting to the tomb which seems to have been completed after Jehangir's death.

This tomb is single-storeyed and square in plan with 325 feet (99.06 metres) side. Each side has eleven archways of equal dimensions, the central one being in an oblong structure which projects forward upon the wings. Four octagonal minarets have been attached to the corners. Each minaret is in four storeys, separated by rotating *chhajjas* and the whole surmounted by a beautiful *chhatri*. The minaret, which rises to a height of 100 feet (30.48 metres) above ground level, is the tomb's most imposing feature and predominates over the whole structure. The marble pavilion that originally adorned the centre of the terrace exists no more.[81] The interior consists of a mortuary chamber surrounded on all sides by a series of rooms and corridors.

The mausoleum has been ornamented very profusely and contains some significant examples of mosaic, inlay and glazed-tiling. The interior has specimens of stucco and painting work as well. The designs are mostly floral with some conventional wine-vases and other motifs. This decoration once more demonstrates Jehangir's love of flowers, with which its builders must have been too well acquainted.

It is its marvellous setting which detains the observer and gives the tomb an astonishingly beautiful character. This is what Percy Brown noticed: 'Viewed as a whole there is in its spaciousness and its setting something of the character of the nature-loving monarch whose remains it enshrines, his preference for wide-terraced gardens glowing with flowers and brilliant colouring generally, recalling similar qualities in his famous ancestor Babur, both of whom seem to have been as much interested in the works of nature as in those of man.'[82]

TOMB OF ABDUR-RAHIM KHAN-I-KHANAN

The tomb of Abdur-Rahim Khan-i-Khanan, who was an important courtier of Akbar and Jehangir and who died in A.D. 1626-27, belongs to the group of octagonal tombs. Unfortunately, it has been denuded of almost all its exterior stone and marble casing and is today in a very dilapidated condition. The tomb stands on a plinth 14 feet (4.27 metres) high and 166 feet (50.59 metres) square. It is double-storeyed, with a central archway on each side, flanked by subsidiary arches. It has chamfered angles and thus is 85 feet (25.91 metres) in diameter. The superstructure

81. This has already been discussed above in connection with the design of Akbar's tomb.
82. Percy Brown, op.cit., p. 100.

consists of a bulbous double dome and four *chhatris* at the corners. Thus the design as well as the plan is fundamentally similar to that of the tomb of Humayun.. However, a great innovation was made in this tomb. It rises higher in proportion to its breadth, so much so that the elevation supersedes the ground plan. This way the architect removed the defect which was inherent in its prototype—the tomb of Humayun. The *chhatris* which flank the dome have been brought closer to the latter and so it presents a more compact impression, there being no gap between the two architectural features. This innovation makes it seem more harmonious and more rhythmically disposed. The stage was now set when the architect of the Taj Mahal could assemble these inspirations and innovations together and work out and evolve his own details proportionately. The tomb of Khan-i-Khanan thus proved to be a stepping-stone to the Taj Mahal and hence holds an important place in the evolution of the Mughal tomb architecture.

CHAPTER 5

The Taj Mahal

THE TAJ MAHAL marks the stage of perfection in the evolution of the tomb, not only in India but also in the whole world. Among sepulchral monuments it is without doubt the most brilliant and the most successful achievement. It is here that the art capabilities of the Indian builder under the Mughals achieved the most beautiful expression. The age of the Taj is the culmination of the art epoch which is generally said to have begun with Babur, but which really derived its greatest inspiration from ancient Indian architectural traditions, which guided the aesthetic norms in all ages, whether under Jaina, Buddhist, Brahmanical or Muslim patronage.

The unique plan and design of the Taj Mahal cannot be attributed to a single master-mind; instead, the various superb features of its construction can be traced systematically to earlier examples during the whole evolutionary process, which ultimately brought about its unrivalled form. It was planned on the river bank, at a respectable distance from the hubbub of the capital, to provide it with a natural environment and a beautiful romantic setting. It was purposely planned to stand just above the water so that the huge mass of white marble rising to a colossal height may tower magnificently and imposingly over its surroundings. The char-bagh plan was again suitably modified. The earlier Mughal sepulchres occupied the centre of the char-bagh; thus the tombs of Humayun, Akbar, Itmad-ud-Daulah and Jehangir are central structures having a four-quartered garden surrounding the tomb on all sides. At the Taj Mahal a marvellous innovation was made. The square garden has no doubt been divided into four large quarters, separated by broad water-channels with fountains and double causeways on either side. But the central point of the char-bagh is not occupied by the tomb but by a raised lotus-pond of white marble, approached on all sides by double steps. The tomb stands to its north, majestically facing it. It is in this novel garden setting that the grand mausoleum of Mumtaz Mahal is presented to the wondering world (Fig. 24). How gracefully its white outlines silhouette against the blank blue sky when seen through the systematically laid garden with a central water-channel in which fountains play and in which the Taj with its prominent central *iwan* appears to float in dreamlike and soft beauty! This garden setting is an important contribution to its aesthetic charm.

26. *'. . . the proud passion of an Emperor's Love*
Wrought into living stone which gleams and soars. . . .'
—Edwin Arnold

27. *The Taj Mahal—sublime in its graceful majesty . . .*

28. *A fairy vision of silvery white mirrored in quiet waters...*
(Copyright, Archaeological Survey of India)

29. (Overleaf). *A shimmering monument on the banks of the Jumna.*
(Copyright, Priyalall & Sons, Agra)

30. (Overleaf). *A poem in stone.*

29

30

31. *Ethereal beauty mirrored in still waters.*
(Courtesy, M. V. Vijayakar)

32. *A dome of the Taj Mahal from a minaret.*

33. *Inlaid spandrels of arches and flanking pilasters with chevron pattern.*

34. *The world can show nothing more beautiful...*

35. *The Taj from the ruins of the Mehtab Bagh of Babur.*

36. Chamfer and superstructure of the Taj from the base of a minaret.

Its presentation in relation to the cues—or the environmental factors—and in relation to the gorgeously set distance has most ingeniously been conceived.

The main gate of the Taj Mahal is as usual on the south side. It has been designed to play a monumental and imposing entrance to the grand edifice. Octagonal towers are attached to its corners which are surmounted by broad impressive octagonal kiosks. The central *iwan* is devised on a semi-octagonal plan, which harmonises well with the perspective view and this the builder had fully experimented with in earlier tombs. White marble has been used on this gateway interspersedly with red sandstone for emphasis and also to minimise the too sober and too classical an appearance of the red sandstone. The most important feature of the gateway however is the introduction of a series of eleven attached *chhatris* with marble cupolas, flanked by pinnacles, above the central portal on the north and south sides. They combine together harmoniously and break the dull skyline effectively, rising higher than the corner *chhatris*, thus proving to be the most suitable superstructure for the portal; they far outweigh in importance the oblong *chhatris* above the central portals of the main structure of Akbar's tomb.

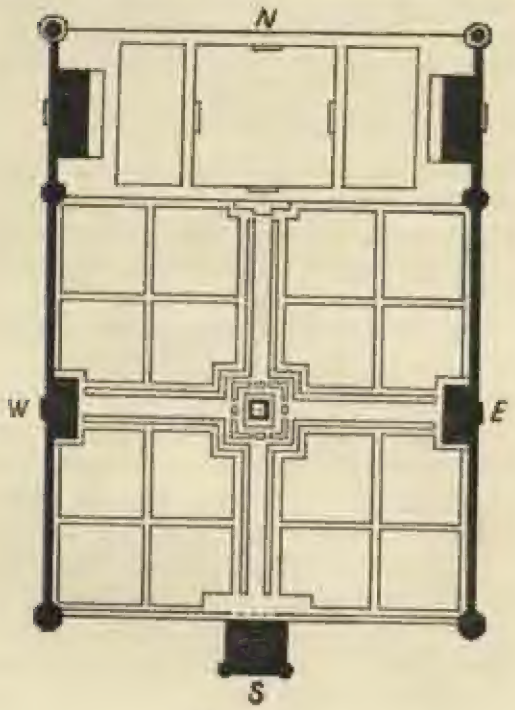


FIG. 24
Garden setting of the Taj Mahal

The lucid ingenuity of the builder and the nature of the innovations he made in the conception of the Taj will be understood by yet another feature of its planning. The tomb of Humayun has false gateways in the middle of the north and south sides. They are on the east and west sides at the tomb of Akbar, where the main gateway has been provided on the south. Again, these false structures are constructed on the north and south at the tomb of Itmad-ud-Daulah as the entrance is through the east side. At the Taj Mahal the builder has substituted these false gateways with beautiful water-pavilions on the east and west sides, each rising at the end of the broad water-canal with which the three arches of its second and the *chhatri* of its third storey react rhythmically. Though each is an independent structure, it forms an inseparable and indispensable part of the whole char-bagh plan. It seems as if the water-channel was especially designed to provide a suitable setting for the water-pavilion.

The tomb-structure occupies the middle of a rectangular space along the river. Here too it does not stand isolated but has a beautiful mosque on its west and an identical structure on its east, generally known as the Mehman-Khana. They are in red sandstone with a liberal use of white marble for emphasis and contrast. No doubt the mosque was a necessary feature in a tomb project such as the Taj. But the provision of its replica on the east side indicates clearly that the builder intended to present the white marble tomb structure, properly flanked on both sides with apparently inferior constructions. Perhaps the builder thus aimed to focus the whole attention of the visitor on the central structure only.

The mausoleum stands in the middle of a plinth 19 feet (5.79 metres) high, with four

minarets at the four corners. The important role which the plinth plays in the total effect can be traced back to the ancient *Vastu*-canons. The plinth formed one of the three main architectural parts of the *prasada* in the vertical section, the other two being the *garbha-griha* and the *sikhara* respectively. The plinth of the Hindu *prasada* was composed of the *jagati*, the *pitha* or *adhisthana* and the *vedika* which was its lowermost part. Each part was divided into many decorative horizontal mouldings. Sometimes an *upa-pitha* was also piled to add to the height. The plinth of the *prasada* has been dealt with in all *vastu*-texts in great detail. This shows that the Hindu architect attached as much importance to the plinth as to the other parts of the structure. It was treated primarily in the vertical section and thus helped to give the building an imposing elevation.

The pre-Mughal tombs lack height. In some cases the tomb structure rises directly from the ground level. The magnificent tomb of Sher Shah Sur at Sasaram is the first important example wherein a wide high plinth has been provided. This idea could have been indigenous as the steps of the first terrace and the massive *chhatris* of the second suggest. The tomb of Humayun has a plinth 22 feet (6.71 metres) in height. It was raised to 30 feet (9.14 metres) at the tomb of Akbar, almost converting the plinth into an independent storey, as it is in fact generally supposed. This height proved to be unworthy of the other members of the Mughal tomb and hence it was reduced to 19 feet (5.79 metres) at the Taj Mahal to be in perfect proportion with the superstructure.

The detached minaret, which occupies each corner of the plinth of the Taj, was not an isolated phenomenon introduced here all of a sudden as a result of some miraculous inspiration; its evolution too can be systematically traced. Detached corner kiosks were used first at the Lodi tomb at Agra as has been explained above. The tomb of Sher Shah has similar detached kiosks on all the four angles of the main plinth, the tomb structure occupying its centre. We meet with attached three-storeyed towers at the Chauburj at Agra. Though its date has not been established it certainly belongs to pre-Akbar times. An attached tower was used assertively first at the tomb of Muhammad Ghaus at Gwalior. It is hexagonal in plan and occupies each of the four angles. It is in three open storeys, the uppermost being a *chhatri* rising above the *chhajja*. The tomb of Akbar at Agra also has attached towers. Four full-fledged minarets appear here for the first time on its main gateway. Each minaret is in four storeys, the fourth being the *chhatri*, which crowns it majestically. Each minaret is circular and tapers as it rises. That their purpose was purely ornamental can scarcely be doubted. These minarets occupy the angles of the gateway, which conventionally would have been filled by kiosks. They rise gracefully high into the sky seemingly carrying the whole body of the gateway with them, attaining predominance and towering magnificently over the surroundings. Their appearance in such a fully developed state marks an important stage in Mughal architecture. The architect learnt how effectively he could replace the attached tower of the main building with the attached minaret or in other words how the tower can assume a determined prominence to appear effectively in the whole architectural composition.

This is what the Mughal builder actually did at the tomb of Itmad-ud-Daulah. Its towers, which are attached to the corners, rise almost two storeys above the terrace, the uppermost being a *chhatri* in each case. The tower is octagonal at the base but attains a circular form above.

The tower continued to rise higher and became more prominent in course of time; at the tomb of Jehangir it is four storeys above the main building and has a distinct individuality of its own. This was a prelude to detachment and placement at a

suitable distance from the tomb. This has been achieved with brilliant success at the Taj Mahal where the four minarets occupy the four corners of the plinth and beautifully flank the central structure. The way in which these minarets harmonize with the tomb proper is a masterstroke of art, more than anything else. It is its charming association with so many other architectural features which give the Taj such an ethereal landing. The tomb of Humayun stands isolated on its plinth without any flanking features; the architect of the Taj Mahal must have noticed this lacuna with regret. He, therefore, ingeniously evolved these features —a pronounced chamfer at each angle of the main building, counter-balanced by a majestic tapering minaret just opposite to it on the main plinth. The detachment of minarets has brought about a unique harmony and balance in the whole composition. Otherwise the tomb would have lost most of its present charm and effectiveness. The central mausoleum is presented magnificently like a lotus flower among a bunch of lotus-buds, rising above green glittering lotus leaves floating on crystal-clear water. The minarets are in perfect proportion with the main building, a feature which is so badly lacking at the tomb of Rabia-ud-Daurani, popularly known as Bibi-ka-Makbara, at Aurangabad.

Thus, though the main tomb is essentially square, it assumes an octagonal shape because of the chamfer at the angles. This octagonalised-square plan is also met with in earlier tombs, e.g., that of Abdur-Rahim Khan-i-Khanan and of Humayun. The earliest Muslim tomb which has this unique plan exteriorly and the same disposal of rooms and corridors in the interior is the Lodi tomb at Agra (Fig. 3). The inspiration for this plan could have originally been derived from that of the Hemakuta temple (Fig. 7) that had an ambulatory outside the wall of the *garbha-griha* (called *andhakarika*) and which is enclosed by the outer wall of the temple as has been mentioned above. Though the details at the Taj Mahal have been refined and perfected marvellously, the plan remains fundamentally the same (Fig. 25). This aspect of its conception too is, thus, a part of the whole evolution of the tomb building art and cannot be attributed to the genius of some one architect alone.

The mortuary hall has been conceived and finished most wonderfully. It is octagonal. The panels on its dados have beautiful floral patterns in high relief or carvo-relievo with the borders in inlaid conventionalized motifs. These bas-reliefs are unrivalled by any other specimen of its class. An exquisitely finished marble trellis-work screen encloses the cenotaphs. The inlay work of its borders and the grace of its *jalies* have rightly earned for it the title of 'chief-d'oeuvre of elegance in Indian art.'

The hall is 80 feet (24.35 metres) high from the pavement to the soffit of the interior dome. It makes sound echo, which 'floats and soars overhead in a long delicious undulation, fading away so slowly that you hear it after it is silent.' The arrangement of rooms and passages is on the other hand double-storeyed, the upper set exactly corresponding to the lower one, i.e., four rectangular rooms on the sides and four octagonal small rooms at the corners, all interconnected by means of passages. The main

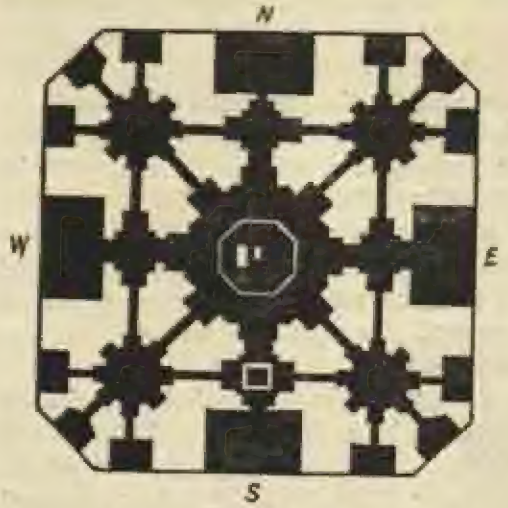


FIG. 25
Plan of the Taj Mahal

hall is also connected with the corner rooms through radiating corridors on the ground floor. But except for the entrance on the southern side, all the other sides have been closed with screens divided into tiny compartments filled with glass pieces. This glass-work has been repeated on all the external sides of the tomb as well as on the upper storey. The glass pieces are perfectly uniform and have been very skilfully manufactured. They are slightly milky so that they are translucent rather than transparent. Only very subdued light passes through these glass-screens and this demonstrates the ingenuity of the builder who devised this feature, which was logically required to temper the glare of white marble which would have been intolerable under the Indian sun. The semi-illuminated, softly lighted hall thus becomes at once a romantic abode for the departed souls; its chastened beauty and almost ethereal atmosphere immediately and forcibly affects the visitor as soon as he enters the beautiful yet solemn hall.

Each facade of the tomb is composed of a grand *iwan* in its centre, occupying practically the whole height upto the parapet which rises well over it to give prominence to the *iwan*. The semi-soffit of this entrance portal has a stalactite pattern. The *iwan* is flanked on both sides by small double arches one over the other. They are rectangular while the arched alcoves of equal size at the angles of the tomb are semi-octagonal. This demonstrates the great care with which the builder conceived and devised all the details, as rectangular alcoves in the front can be distinctly visible from afar, but those at the angles can only be seen in full if they are semi-octagonal. Thus, he never lost sight of the perspective view through which he proposed to present his creation so effectively.

Each section in the facade is well demarcated on both sides by attached pilasters which rising from the plinth level of the tomb rise above the frieze and are crowned by beautiful pinnacles with lotus-buds and finials. These pilasters have a chevron pattern in black and yellow on a white marble background and are flanked at the base by panels which have similar borders. They add splendidly to the whole effect; their pinnacles gorgeously ornament the superstructure and help along with the other features to break the skyline gracefully.

A bulbous white double-dome with a broad *padma-kosa* and beautiful *kalasa*-finial majestically crowns the Taj (Fig. 26). The dome of the tomb of Sikandar Lodi at Delhi, dated A.D. 1517, is an early example of the double-dome type. The single dome had already been raised too high and now it had become quite out of proportion with the interior. Guided by the necessity of still raising the height of the dome a double-dome was devised first at the tomb of Taj Khan at Delhi, about A.D. 1501. This structural device provides space between the outer and inner shells of the dome. Thus while it also provided a suitable and proportionate ceiling to the interior hall, at the same time it enabled the builder to raise the height of the dome as much as he desired in order to present a lofty and imposing exterior. He was thus guided solely by structural requirements. The space within is hollow and the inner cell reduces the weight of the dome and at the same time allows it to rise majestically high above into the sky to the desired height. Without such a device the main chamber would not have allowed the superstructure to rise beyond

Fig. 26
Double dome of the Taj Mahal

certain limits. The first surface roofed the hall below while the second outlined the monument in space. It is the double-dome which proclaims the monument from afar.

The earliest example of a double-dome in India is the brick temple of Bhitargaon of the Gupta period.[82a] Later brick temples at Parauli and Kurari in Uttar Pradesh and Sirpur and Pujaripali in Madhya Pradesh also have a double-dome device in their *sikharas*. The Muhammedans in India, for the first three centuries of their rule, did not use it. The domes of the Khaljis, the Tughlaqs and the Sayyids are consequently of the single-dome type. It accounts for their being too broad, massive and shallow. The tomb of Humayun has a fully developed double-dome and it seems that the architect of the Taj borrowed this double-dome idea from it.

The bulbous dome of the Taj Mahal is most important from this point of view. It rests on an extraordinarily high drum and rises to a total height of 145′ 8½″ (44.40 metres) from the base of the drum to the apex of the finial. It will at once be seen that such an extraordinary height has been given to the dome to allow it to tower over the lower structure. It is in the supreme elegance of the central dome that the beauty of the Taj culminates.

The dome is flanked on all the four angles by four very appropriate *chhatris*, which though sufficiently detached, appear to be attached to it when viewed from all sides. The builder had learnt a lot by the apparent mishandling of this feature at the tomb of Humayun where the kiosks seem to be too detached from the dome. At the Taj he calculated the distance between the two features for the accurate relationship they were intended to present together. The dome is never presented alone, but always in terms of the *chhatris* amid a cluster of pinnacles on all sides. It is this *panch-ratna* plan that endows the Taj with such unprecedented impressiveness and grace.

THE ORIGIN OF THE TAJ MAHAL

There is no doubt that the idea of the Taj Mahal originated with Shah Jehan who was deeply bereaved by the loss of his queen Arjumand Banu Begum, entitled Mumtaz Mahal, 'the Light of the Palace,' the daughter of Asafkhan and the grand-daughter of Mirza Ghiyas Beg. The shock was much aggravated by the irrevocable separation which Providence decreed for them at the moment, when after long suffering and struggles, the time had come to live a settled life in full comfort and splendour. Mumtaz shared the misfortunes of her husband without a murmur. She was with him during the most trying and dangerous moments of their married life. She accompanied him to Rohtasgarh in Bihar, as well as to Asirgarh in Deccan. She bore the sheer excitement and the difficulties of those years without a grumble when her husband turned rebel against the authority of the Grand Mughal Emperor. It was naturally a colossal shock to the Emperor that his beautiful queen died within three years of his accession to the throne. He decided to perpetuate her memory for immortality; or in other words, he decided through this opportunity to give vent to his taste for architecture in which he was inherently interested from the days of his youth.

Shah Jehan was busy dealing with the rebel Khan-i-Jehan Lodi and was camping at Burhanpur. It was there that Mumtaz Mahal delivered her fourteenth child and died, on Wednesday 17th of Ziqad 1040 A.H. (A.D. 1630).[83] Shah Jehan was much grieved and wept bitterly; Abdul Hamid Lahauri, the contemporary historian, records that prior to this tragedy he did not have even twenty grey hair in his beard; but after this incident the majority of the hair in his

82a. See author's monograph on 'The Art and Architecture of the Brick Temple of Bhitargaon,' *Marg*, Vol. XXII, No. 2 (March, 1969).

83. Bebadal Khan composed a couplet which contained the date of her death—'Jaye Mumtaz-Mahal Jannat-bad.' Cf. Abdul Hamid Lahauri, *Badshahnama*, (Bib. Ind), Vol. I (Calcutta, 1866-68), Part I, p. 389.

beard turned grey.[84] For two years he remained aloof from tasty dishes, gorgeous robes, music and merriment and other recreations. The idea of the Taj thus grew in sorrow and it is rightly called a Monument of Grief. At least this much of personal character it bears.

Mumtaz's body was deposited temporarily in the Zainabad garden at Burhanpur.[85] Six months after her death, the body was transferred to Dar-ul Khilafat Akbarabad (Agra) accompanied by Shah Shuja, Sati-un-nissa Khanam, the maid and a close mate of the deceased queen, and Wazir Khan, the court physician.[86] A piece of land (*zamin*) was selected for her burial at Agra.[87]

The piece of land on which the Taj stands originally belonged to Raja Mansingh and was now owned by his grandson Raja Jaisingh.[88] This plot was selected for burial and the arrangement was gladly accepted by Raja Jaisingh.[89] Lahauri explicitly mentions that another plot was given to him from the crown lands in exchange for this piece of land.[90] The work on the proposed project began from its very foundations in the beginning of the fifth year of accession.[91] Under expert and efficient supervision, *sangtarash, sadakar, pachchikar, munbitkar, kalasa-saaz, tughra-navis* and other artisans set to work. The grand project took about seventeen years, during which more than 20,000 workers were constantly employed. Marble, red sandstone and other stones were supplied free by the vassal states. The State treasury supplied other materials including 40,000 tolas (466.550 kilograms) of pure gold which was valued at rupees six lacs (at the rate of fifteen per tola between A.D. 1631 and 1647).[92] Hard cash was chiefly paid as wages to the labourers and the artisans. In view of the evidence from Persian sources and the accounts of foreign travellers, particularly Peter Mundy, Tavernier, Manucci, and Bernier, reinforced by the unmistakable architectural evidence, the assumption that the Taj was originally a Rajput palace and was converted into a tomb as claimed by some, is completely absurd and without warrant.

The names of many of the builders who participated in the construction of the Taj in different capacities have come down to us through Persian sources.[93] Amanat Khan

84. Cf. ibid., p. 388.
85. Ibid., p. 386, 'ba-ruam amanat madphoon gardanidan.' That it was laid there temporarily with the express intention to remove it later is again confirmed by Lahauri: 'ba-tariqaye amanat madphoon bood.' Cf. ibid., p. 402.
86. Ibid., p. 403.
87. Ibid., p. 403, 'va zamin-e dar nihayat rifat va nuzzat hat ki junoob roya aan mishra jame ast.'
88. Ibid., p. 403, 'va pesh azin manzil Raja Mansingh bood—va dari vaqt ba Raja Jaisingh nabeeraye oo talluqdast.' 'Manzil' literally means the halting place. Here it signifies the land whose description is continuing. It does not and cannot mean 'Ala Manzil' as has wrongly, and no doubt mischieviously, been interpreted in the *Mother India* of February 1967. The word is distinctly and unmistakably '*azin*' and not '*ala*'.
89. Ibid., p. 403, 'baraye madphan aan bahisht mauttin bar guzidan....agarche Raja Jaisingh husool een daulat ra phauz-e azeem danisht.'
90. Ibid., p. 403, 'dar evaz (exchange) aan aali manzil az khalsaye (from Khalisa—crown lands) sharifa bau marahmat pharmudand.' All this has been attested and confirmed by Muhammad Salih Kambo, *Amal-i-Salih* (Bib. Ind.) (Calcutta, 1923-39), Vol. I, pp. 448-52.
91. Lahauri, Vol. II, pp. 322-23, 'dar ibtdaye saal panjum juloos vala, vajhat tasis een bina rafi ul buniyan ki musharraf ast bar dariya-e jun'; 'va dar usthari namoodar istqamat azayam baqi tarah-afgandan' (foundations were laid); 'va dariya-e mazboor shumali su muttasil aan jari aghaz hafr namuda amad'; 'va pas azan ki beldaran ahin-e dast kavi bazu bajadkari tamam ba-ab rasanidan ....buniyanan badi kar va mehmaran shingraf asar asas....ra basang va tarooj dar kamal matanat va risanat bar avurda va satah zamin barabar sakhtan.'
92. Ibid., Vol. II, p. 326.
93. E.g., the ms. entitled 'Taj-Mahal,' in possession of the Department of Archaeology, Northern Zone, Agra (copied from some original reliable work in 1878 by Mughal Beg); the ms. by Syed Hasan entitled 'Taj-Mahal' in possession of Agra College, Agra (also copied from some other original in 19th century); the ms. entitled 'Diwan-i-Afridi' in possession of the Khudabakhsh Library, Patna, chiefly relied upon by Sir Jadunath Sarkar, cf. *Glimpses of Mughal Architecture* (Calcutta, 1953); Abdul Hamid Lahauri, *Badshahnama* (Bib. Ind), Vols. I, II (Calcutta 1866-68); Muhammad Salih Kambo's *Amal-i-Salih*, (Bib. Ind.) Vol. I, (Calcutta 1923-39).

Shirazi has unanimously been mentioned as the *tughra-navis* (calligrapher) and this fact is attested on the Taj gateway where his name has been inscribed at the end of the inscription. Ismail Khan served as the dome builder. The names of many Hindu inlayers have also been recorded.

Some 19th century works mention Ustad Isa Afandi as the designer of the Taj Mahal. It must again be emphasized that the design of the Taj Mahal cannot be ascribed to any single master-mind, Ustad Isa or anybody else. The Taj is the culmination of an evolutionary process, the preceding stages of which, featurewise, can be traced systematically. It is the perfected stage in the development of Mughal architecture. May be, Ustad Isa suggested the various details in the proposed plan he submitted for consideration, which were true to the traditions of the country—which were in strict accordance with the aesthetic values nurtured by the patrons of arts and architecture in India from times immemorial. May be, his plan served as a stepping stone to the wooden models in which the proportions of the mausoleum were evolved and finally perfected.

Some European scholars held the view that the Taj was designed by an Italian—Geronimo Veroneo. This was first suggested by Father Manrique, an Augustinian Friar, who came to Agra in A.D. 1640 to secure the release of Father Anthony who had been imprisoned at Hughli by the Mughals. He went to Lahore in the same connection and ultimately his request was acceded to. It was there that he met Father Joseph de Castro, the executor of Veroneo who died at Lahore in A.D. 1640. De Castro gave him this information, which he recorded in his *Itinerario delas Missiones del India Oriental*. Manrique notes, 'El architecto destas fabricas fue un Veneciano por nombre geronimo Veroneo que passo a aquellas partes en las naves de Portugal y murio en la ciudad de haor poco tiempo antes de ma elegada' (The architect or designer of these buildings was a Venetian by name Geronimo Veroneo who came in the Portuguese ships and died at Lahore shortly before my arrival).

The view was shared by many scholars of note. Particular mention may be made of Rev. H. Hosten, S.J., who spoke of it very affirmatively.[94] But a scrutiny of the contemporary and later records does not confirm the assumption. Persian sources make no such mention. Veroneo was seen by some trustworthy Europeans at Agra who have mentioned him as a jeweller. Peter Mundy was personally known to Veroneo and received him at the English House at Agra. He described him as a Venetian and a goldsmith.[95] R. C. Temple rightly notes that 'It is noteworthy, however, that though this building [the Taj] was in course of construction while Mundy was in residence at Agra and though Veroneo was personally known to him yet he says nothing of the Italian's connection with the work. Had Veroneo really been the architect it is unlikely that so accurate a chronicler as Mundy would have failed to mention the fact. He saw the work going on "with excessive labour and cost and prosecuted with extraordinary diligence." '[96] There is no doubt that had Veroneo been connected with the Taj which was then under construction, such an accurate observer as Mundy would not have failed to mention it, as Temple maintains. English factory records also allude to him as an Italian jeweller.[97] Tavernier, the French traveller who himself was connected with the Mughal court as a jeweller, also does not speak of him as the designer of the Taj Mahal. These Europeans would have recorded this feature without fail and not without a sense of pride, had it been a fact. They give a graphic descrip-

94. Cf. 'Who Planned the Taj?' *Journal of the Asiatic Society of Bengal*, June 1910, (Vol. VI, No. 6, New Series).
95. Cf. R. C. Temple, *Travels of Peter Mundy* (London 1914), Vol. II, p. 208.
96. Ibid., Introduction.
97. Cf. W. Foster, *The English Factories in India (1637-41)*, p. 13.

tion of the Taj and would not have missed to mention its architect had he really been Veroneo, particularly as he belonged to their own homeland.

Most important from this point of view is the allusion of Father Francis Corsi, S.J., who had intimate connections with the Europeans at Agra and Lahore. He mentions Veroneo as 'Que tembellas maose boas abili dades pafazer pezas curiozas de oro esmaltadas compedraria' (who had fine hands and great skill for making curious pieces in gold set with precious stones). At the most he may have been employed on the gold work and the gilding by Jehangir and Shah Jehan, including the thrones, the ceilings of some residential apartments and the original golden curtain around the cenotaphs at the Taj Mahal. In this capacity he must have served under Austin or Augustine of Bordeaux at least upto A.D. 1632 when the latter died.

Father Hosten tried to uphold Veroneo's claim but he failed to outdo E. B. Havell who repudiated it in toto.[98] In the absence of any documentary evidence in its favour, and in the face of overwhelming records against it, the assumption seems to be too imaginative to be believed. Hosten's plea that the foreign travellers 'must not be expected to have recorded everything'[99] is hardly convincing. He seems to have attached too much credit to Father Manrique's statement. E. A. H. Blunt committed a similar mistake.[100]

Veroneo or any other European could not have been conversant with the traditional building techniques of India which have so successfully been represented at the Taj Mahal. Veroneo had not a past as an architect either in India or Italy. Nor does he seem to have received any recognition later. The Taj is not an isolated phenomenon; its is not a meteoric idea! It marks the perfect stage in the evolution of the tomb in India. As E. B. Havell defined it, 'It was of a living organic growth born of the Indian artistic consciousness.... The Taj is not an isolated phenomenon, the creation of a single master-mind but the glorious consummation of a great epoch of art.' Percy Brown rightly comments: 'And as an answer to the Jesuit Father's contention there is the standing testimony of the Taj Mahal itself which shows in all its aspects that it was the natural evolution of the style, true to tradition and entirely unaffected by occidental influence.'[101]

THE GENESIS OF THE TAJ'S PERFECT PROPORTIONS

The Taj rises to a total height of 243' 6" (74.21 metres) upto the finial.[102] The height thus exceeds the breadth by more than 56 feet (17.07 metres)—which at once gives it an imposing and a majestic appearance. The tomb of Humayun is too

98. Cf. 'The Taj and its Designers,' *Nineteenth Century and After*, 1903, pp. 1039-49.
99. Cf. op. cit., p. 287.
100. *Christians' Tombs and Monuments* (Allahabad, 1911), p. 41f.

101. Cf. *Cambridge History of India*, Vol. IV (1957), p. 562. W. H. Russell, special correspondent of the *Times* in India (cf. *My Diary in India 1858-9*, Vol. II, London, 1860, pp. 265-66) observed: 'It is said the Taj must be of Italian construction but no one can say the idea is anything but oriental. It is impossible to conceive for a moment that the Taj was designed by an Italian. To my mind the idea stamped upon the building is intensely Mahomedan and oriental.... I have no knowledge of architecture but I can appreciate to a certain extent the influence of external lines and forms and it strikes me that there is nothing in Italy that I have seen like this mausoleum at Agra; so there are in the east many religious or sacred edifices cognate to it in expression.... It is alone in its loveliness—pure and chaste and graceful among all the architectural triumphs of man.' Sir John Marshall (*A. S. I. Annual Report 1904-5*, pp. 1-2) also rejected the view; he wrote: 'The wild improbabilities involved in this account is uncorroborated....The Taj is typical in every feature of the spirit of the Orient, of which it is perhaps the highest expression and above all of the Imperial spirit of the age of Shah Jehan when the keynotes of art were graceful simplicity and elegance and when marble was everywhere taking the place of coarser materials....It is incon-

broad in relation to its height and an attempt was made to improve the effect at the tomb of Khan-i-Khanan which belongs to the same class. As a matter of fact, it was the superstructure which always required the greatest manipulative skill and ingenuity of the builder. Examples may be cited from the octagonal tombs. The mausoleum of Mubarak Sayyid (A.D. 1434) lacked height and in the later tombs of this class the architect attempted to raise the superstructure. He even went to the extent of elevating the drum of the dome to the dimensions of an additional storey and created a perfect example in the tomb of Sher Shah. It is the height which plays the predominant part in the total aesthetic effect of an architectural work, provided it is in complete harmony with the ground plan. This is what the ancient Hindu *Vastu*-canons precisely prescribe. The *talachhanda*, or the rhythm of the level, must be in proportion with the *urdhvachhanda* or the rhythm of the elevation, so that the two fundamentals of a building could be harmoniously interconnected. The Hindu *prasada*, for example, was designated architecturally as *vi-mana* because it was built strictly in accordance with the 'various proportionate measurements or various standards of proportionate measurement.'[103] Three groups of lines determine the rhythmical disposition of the plan; the *pramana-sutra*, the *paryanta-sutra* and the *vinyasa-sutra*. This perfectly evolved method of expressing the proportionate measurements of the horizontal parts of the temple with reference to the vertical ones and vice versa 'shows that the building was regarded as a three-dimensional unit interconnected in all its parts.'[104] According to the *Vastu*-canons, the height must exceed the width of the *prasada*; the *Brhat-Samhita* and the *Matsya-Purana* prescribe that the total height of the temple must be twice the width of its square, 'the width of the *garbhagriha* being 2 that of the *prasada* is 4, this is also its height; it is a perfect cube and from it rises the sikhara to twice this height; the wall measuring 4 the sikhara has 8 units in height.'[105] There seems to be no doubt that these rules were in the mind of the builder when he evolved the proportions of the Taj Mahal. The proportions of the octagonal mortuary hall, which measures 58 feet (17.68 metres) in diameter, with the total height of the building, i.e., 243' 6" (74.21 metres) is roughly 2:8. The Hindu artisans who were patronised by the Mughals could have safely suggested these well-tried aesthetic norms which they could successfully transfer from a Hindu *prasada* to a Muslim tomb.

Mughal Beg mentions that Shah Jehan decided to build a *nayab, kamal, latif* and *ajeeb-o Gharib* tomb in memory of his deceased queen and he sent for a council of expert builders.[106] The designers submitted plans for the proposed tomb on paper.[107] One was selected by the Emperor; according to this a fine model in wood was prepared.[108] Shah Jehan had his own ideas about the proposed tomb and seems to have made valuable suggestions.

All this leads us to believe that the proportions of the Taj Mahal were evolved first on a wooden model and as it seems certain many wooden models were prepared which

ceivable that a European, like Veroneo, imbued as he must have been with the traditions of the Renaissance, could have so completely divested himself of those traditions and could have entered so intimately into the spirit of an alien style as to create not only a masterpiece in that style but one that is true to it in every essential detail.'

102. Gordon Sanderson, *A. S. I. Annual Report 1913-14*, p. 130; it is not 187' (57.00 metres) as Brown (cf. op. cit., p. 108) noted. *Badshahnama* and *Mirat* both give its total height to the top of the finial to be 107 ziras=285' 4" (3 Ziras=8 feet). It therefore seems to have been measured from the river level.

103. Kramrisch, op. cit., p. 133.

104. Ibid., p. 238, ftn. 21.

105. Ibid., p. 237.

106. The ms. is entitled 'Taj Mahal' and is in possession of the Department of Archaeology, Northern Zone, Agra.

107. Ibid., f. 11, 'Kaghaz nakshaye maqbara, har ek ustad meen aavardand.'

108. Ibid., f. 11, 'choon ik nakshapasand aaleehazrat aamad; bamujib aan naksha intekhabe rauzaye chaubee taiyar shud.'

helped to develop the perfect design. This was adopted and was translated into stone in actual size. It was at this stage that the indigenous builder could safely make his own suggestions which helped to bring out the final design. The perfect proportions of the Taj Mahal cannot be explained otherwise.

THE GARDEN AND THE WATER-DEVICES OF THE TAJ MAHAL

It is at the Taj Mahal that the garden and the water-devices have been manipulated most successfully to create the best and the most magnificent architectural effect. Though, as usual, the char-bagh plan has been adopted, here it has been put to a better use than in any earlier example. The mausoleum, instead of occupying the central point, stands majestically on its north side just above the river, while the whole garden has been placed at its feet in simple adoration. Each of its four quarters has again been sub-divided into smaller quarters with broad stone-paved raised pathways (Fig. 24). The centre of the garden is occupied by a raised marble lotus-pond with a cusped and trefoiled border. Everything has been laid out in perfect symmetry in itself as well as in relation to the whole composition. The tomb structure has thus been presented in an extremely beautiful setting composed of a broad canal studded with fountains, stone-paved pathways, parterres, cypress-avenues

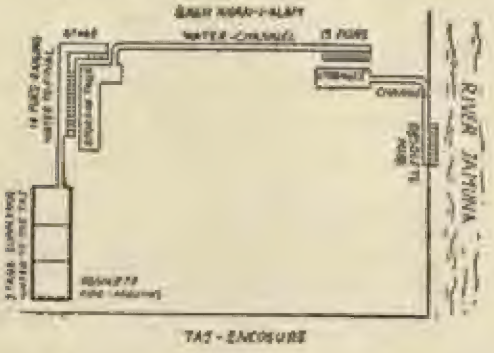


FIG. 27
The water-system of the Taj Mahal (Plan)

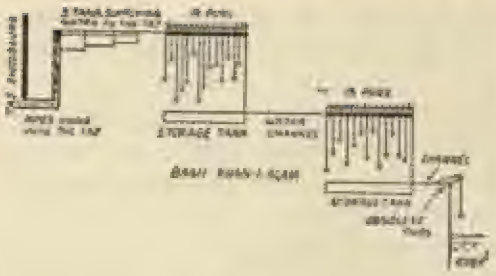


FIG. 28
The water-system of the Taj Mahal (Section)

and flower-beds—each forming an integral part of the whole plan. The garden approach has been worked out carefully in relation to the architectural scheme as a whole. This emphasises the great conception which preceded its construction. The garden-designer and the architect collaborated to work out a perfectly co-ordinating and unified composition.

The architect, who was fully conscious of the unaesthetic appearance of the grotesque *pur*-ramps and crude conduits, selected the adjoining Bagh Khan-i-Alam for procuring water for the Taj Mahal. A series of *purs* (manual draws), storage tanks and water-channels could be built there and abundant water could be brought to the Taj through underground pipes without at all jeopardizing the aesthetic aspect of the grand project. It was a novel idea which like all other details of the Taj Mahal was guided by aesthetic consideration and was premeditated with the utmost precision.

Water was drawn from the river by a series of *purs* and was brought through a broad water-channel into an oblong storage tank of great dimensions (Figs. 27 and 28). It was again raised by a series of thirteen *purs* which were worked by bullocks. Except for the ramps, the other features of the whole water-system have survived. An overhead water-channel supported on massive arches carried water into another storage tank of still greater dimensions. Water was finally raised by means of fourteen *purs* and passed into a channel which filled three supply tanks, built massively over-

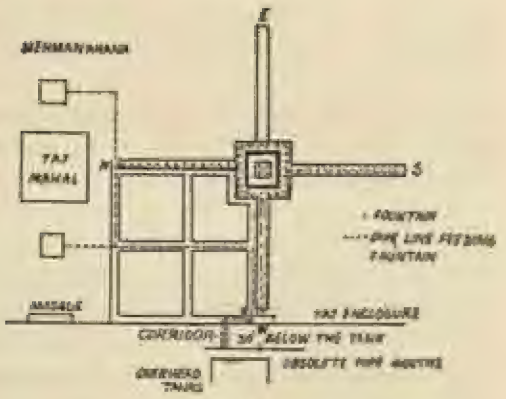


FIG. 29
The water supply system of the Taj Mahal at Agra

head the gate of Bagh Khan-i-Alam. The last tank had pipe mouths in its eastern wall. The pipes descended below and after travelling underground through the intervening corridor crossed into the Taj enclosure near the western water pavilion (Fig. 29).

There are no water-chutes in the Taj Mahal. Instead, the whole ethereal effect has been obtained by fountains which have been laid systematically in the main south-north canal. Five marble fountains have been placed superbly in the raised central lotus pond. Another twenty-four ornament this pond on all the four sides. Twenty-four fountains have been set on its south and another twenty-found on its north side. The planner desired to add to the beautiful view of the mausoleum from the front by providing these wonderful bud-shaped fountains in the exact centre. Lest the attention be diverted to the sides and a part of the wizard's charm be broken, he has placed no fountains in the west-east canal! This shows how carefully he calculated the aesthetic effect of the water-devices and the garden which thus form integral parts of the Taj Mahal. It is through the silvery spray of these fountains and the delicate small waves of water in this broad canal running along the whole span of the garden that the architect desires to present his wonderful creation. The water-channels at Akbar's tomb, Sikandara, are narrow threads of water; at the Taj they are broad glistening sheets of crystal clear water allowing the reflection of the pure white tomb to dance in its soft ripples that the air intermittently creates. In its immediate neighbourhood cypress-avenues and flower-beds have been laid symmetrically; the deep green cypress trees with their slender rising shapes and curving topmost crests are mirrored in the water while between their dark reflections shines the beauty of the immortal Taj—a miracle revealed through the genius of the Indian builder. The subtle shadows combine harmoniously and create a wonderful impression of beauty, grace and grandeur.

Underground pipes fed the fountains. One pipe line runs directly towards the mosque to supply the fountains in the tanks on the red sandstone plinth below the marble structure. Copper pipes were used for separate series of fountains in the north-south canal, the lotus-pond and the canal around it.

An ingenious method was devised to ensure uniform and undiminished water pressure in the fountains, irrespective of the distance and the outflow of water (Figs. 30 and 31). The fountain pipes were not connected directly with the copper pipes feeding them as this would have resulted in a gradual

FIG. 30
Water supply for the fountains of the Taj Mahal (Plan)

FIG. 31
Water supply for the fountains of the Taj Mahal (Section)

decrease in the volume and pressure of the water. Instead, a copper pot (*kalasa*) has been provided under each fountain pipe—which was thus connected with the water-supply only through the pot. Water first fills the pot and then only rises simultaneously in the fountains. The fountains are thus controlled by the pressure in the pots and not by the pressure in the main pipe. As the pressure in the pots is uniformly distributed all the time, it ensures an equal supply of water at the same rate in all the fountains. This shows the great amount of pre-conception of the minutest details with which the Taj is associated. It is really creditable that the planner spared no efforts —belonging to art, architecture and engineering—to create a perfect production without the slightest weakness, architectural or aesthetic.

The main supply of water was however obtained through earthenware pipes. One such main was discovered under the bed of the western canal. The pipe is 9" (0.23 metres) in diameter and has been embedded in masonry at a depth of 5 feet (1.52 metres) below the level of the paved walk. Evidently the Mughal water expert was a master of his art and successfully worked out the levels in relation to the volume of water to ensure its unobstructed supply for centuries. He anticipated no repair work and therefore made no provision for it; hence the extraordinary depth at which the pipe was sunk.

The original intention of the builders of the Taj was probably to present the composition as a whole without being obscured from view. This is more than confirmed by the method with which the garden is irrigated. Except for the outlets at the two extreme ends, the garden is irrigated by the overflowing of canals. The north-south canal has inlets of water through fountains. The west-east received its water through an interconnection with the north-south canal. Thus the quarters near the canals received an adequate supply of water while the distant quarters got a smaller supply. Obviously the quarters near the canals could be used for growing flower-plants like roses, tulips, crown-imperials, lilies, irises, marigolds and others which would not obscure the general view. The distant quarters on the other hand were suitable only for tall trees, preferably fruit trees like the mango, orange, lemon, pomegranate, apple, guava, pineapple, palm and others. This shows that originally the Taj could be seen fully, in all its perfect beauty, without it being even slightly obscured as it is today. Its makers were moved by that overpowering sense of beauty which led Keats to exclaim, 'A Thing of Beauty is a Joy for ever.' They wanted to convey 'a joy for ever' and hence created a thing of beauty in right earnest. There is definitely no other monument in the world in which the aesthetic considerations are so elaborate and yet so determining.

THE AESTHETICS OF THE TAJ MAHAL

Attempts have sometimes been made to compare the Taj with the Parthenon at Athens which was constructed between 447 and 432 B.C. and was dedicated to the goddess Athena Parthenos. Not only are the two constructions separated by more than 2000 years, the two conceptions also differ fundamentally as one is a Greek temple and the other a Mughal tomb. The comparison is thus unfortunate unless we merely care to examine the total aesthetic effect in each case, from which point of view the Parthenon is insignificant in comparison to the Taj Mahal. The Parthenon is an isolated structure as is the Kandariya Mahadeva temple at Khajuraho, with no garden-setting, wings, detached minarets or other flanking accessories. It is simple in outline and depends on uniformly disposed pillars for its external adornment. The Taj Mahal, on the other hand, is a grand project with so many fine features, inseparably associated with it, all pre-conceived in their minutest details and brilliantly put together

to produce the most harmonious impression which was fully anticipated. The proportionate disposal and a consequential melodic combination of its various parts and its singularly varied and pleasing outlines are the aspects which place it on a far higher aesthetic footing than the Greek Parthenon.

Fergusson did not do justice when he allotted greater credit to the Parthenon than to the Taj. The great sculptures inside the Parthenon, the wonderful artistic pieces by the master-sculptor Pheidias, proved to be the determining factor in his judgment. Sir Banister Fletcher too was impressed by its ornamental qualities rather than by anything else; 'This miracle of architecture compact of glistening marble, marvellous sculpture and glowing colour, has thrown its glamour over men through all the ages and more than justifies the poetic description of Emerson—"Earth proudly wears the Parthenon as the best gem upon her zone." '[109] It is however a wrong basis on which to decide such delicate issues. In their class the marble dados of the Taj, with the superb inlaid borders and carved *guldastas* in bold relief in the centre, are unsurpassed in the same way as are the sculptured pieces of the Parthenon in their own class. The two cannot and should not be compared. Least can they be taken as criteria to judge the technique, the aesthetics and the phonetics of the buildings they respectively adorn, as Fergusson erroneously has done. The Taj is a far more superb conception and a more magnificent creation than the Parthenon or any other monument in the world. Fergusson lamentably underestimated the aesthetics of the Taj when he allotted only five parts of aesthetic value as against four of the Parthenon; only the aesthetics of the former deserves all the twenty-four of the latter.

As has been described above, the grand elevation, the minarets and other flanking accessories play an important part in the aesthetics of the Taj Mahal. The beautiful garden setting has been worked out skilfully to present the white marble sepulchre amid a number of pleasing features. Then there is the background of the Taj Mahal which has been manipulated ingeniously to work wonders on visual perception. In all earlier examples, the char-bagh has been used with a Mughal tomb to provide it with a setting and also a background. Here at the Taj Mahal the garden has been laid out entirely in front of the tomb proper with the sole object of giving it a beautiful setting. This garden does not play any part in the 'background' of the Taj Mahal which has, instead, been provided for by the sky. The Taj overhangs the river majestically and is always seen with a blue sky in the background. This background is not constant; it changes its colour and texture more than often, and the Taj is always seen in this ever-changing, and hence ever-new background. Its shades are subtly reflected on the white marble surface of the Taj Mahal which changes its colour and complexion accordingly. The Taj is thus presented in a variety of tints and moods. In early morning it appears to be fresh and lively like a white lotus bud at the point of opening; it looks to be sad and sober like a yellowish narcissus when the pale sunset glow softly descends upon its contours. When seen in the dark night it appears to be undisturbably sleeping, while in full moon the Taj seems to be wide awake with some pleasant surprise like a blooming rose! Every time it appears to change its mood because we never see the Taj alone but always in relation to the everchanging blue sky in its background. It is because of this feature that it appears ever-new and ever-fresh and this eternal newness is the most important factor of its aesthetics. It is surprising, and equally commendatory, that the planner of the Taj Mahal could combine Nature with his creation so inseparably and yet so imperceptibly as to produce such beautiful colour effects.

109. Fletcher, op. cit., 17th ed. (London, 1961), p. 123.

Besides these, there are other points which add immensely to the overall aesthetic impression. They are however not normally perceptible and are therefore seldom understood. They deserve, therefore, a detailed explanation.

The Taj is a superb combination of various parts which have been assembled together in perfect symmetry and pleasing proportions. The structural masses have been balanced most harmoniously. The total unity which has thus been obtained is simply graceful and enchanting. If we aim to appreciate a work of art our approach towards it should be synthetical. We cannot know or appreciate it in parts; we can do so only as a whole. The parts therefore should be so assimilated together that each looses its identity in the total unity. The architect must be conscious of this synthetical nature of art as much as the painter is and should combine so as to produce absolutely a new thing. He must create an illusion which is always more beautiful than reality. The beauty of a girl is also an illusion, technically, because there would be no beauty if we see her microscopically; if we see her in parts she would no longer remain beautiful. It is, therefore, due to the total unity which is presented to us as a whole that the girl is seen to be beautiful.

What does a painter do? He tries to imitate the reality on his board; in other words he creates an illusion. The worst scene of a lane full of dirty garbage could appear beautiful in his painting! The creation of the illusion is a necessary corollary of all arts—painting, music, sculpture and, of course, architecture.

The 'scene' of the painting is a two-dimensional illusion. The 'kinetic volume' of sculpture on the other hand presents a three-dimensional illusionary space.[110] The reality in either case may not exist. But in architecture the problem centres round a co-relation between the reality which is no doubt present and its appearance. It is the reality which the architect so manipulates as to give a beautiful and no doubt an illusionary appearance. This illusion of architecture is easily missed because of the obviousness and importance of its actual and functional values. But the illusion of the 'ethnic domain' always exists because 'virtual place' is created by the treatment of an 'actual place.'[111] It is here that the skill of the architect is most faithfully represented. He weaves his warp and woof so as to create a beautiful thing—a thing which appeals to the aesthetic sense; he expresses himself so as to create a beautiful impression, the latter being fully anticipated in the former. Hegel aptly points out that the task of architecture 'lies in so manipulating external inorganic nature that it becomes cognate to mind, as an artistic outer world. The material of architecture is matter itself in its immediate externality as a heavy mass subject to mechanical laws and its forms do not depart from the forms of inorganic nature, but are merely set in order in conformity with relations of the abstract understanding, i.e., with relations of symmetry.'[112] The Taj stands as the most brilliant example of this phenomenon.

We appreciate the beauty of the Taj Mahal, but generally we do not bother to discover the contributory factors which make it so beautiful. Generally speaking we receive a beautiful impression, but we do not study those essential parts of this beautiful expression which have so ingeniously been assembled together by the architect to bring about this effect. It is like a smile we think we see but 'in reality we have only a vague impression of it, we do not perceive all the characteristic traits of which it is the sum, as the painter discovers them after he has worked upon them and is thus able to fix them on the

110. Susanne K. Langer, *Feeling and Form* (New York, 1952), pp. 87-88.

111. Ibid., p. 95.

112. Bernard Bosanquet, *A History of Aesthetics* (London, 1949), p. 481, quoted from *Hegel's Aesthetic*, Vol. I, pp. 89-114.

canvas.'[113] The great ingenuity of the architect of the Taj lies in the fact that he distinctly studied the 'characteristic traits' of this total unity and unmistakably anticipated the beautiful expression which the combination of these traits presents. The anticipation of the combination as beautiful is what has brought about its incarnation, and the architect's—nay, the artist's—skill deserves all applause for bringing about this combination so successfully.[114]

The composition of the forms and lines of the Taj Mahal is perfectly symmetrical. Here we meet with a beautiful admixture of lines, horizontal with vertical on the one hand, and straight with curved on the other—all harmoniously set together in the total unity. They adopt each other with amazing uniformity. The combination is entirely rhythmic and melodic. Particularly noticeable are the semi-octagonal alcoves at the chamfered angles which are perceptible from every perspective view and give a three-dimensional appearance from the outset (Fig. 32). They emphasise the diagonal lines and suggest depth.

This great depth has also been further suggested by the double arches, one over the other, on each side of the central portal. The solids and voids have very judiciously been distributed that provide a variety, yet an undiminished uniformity. These alcoves, the balconies in each minaret, the *chhatris* near the dome, and certain pronounced projections in each facade allow a beautiful play of light and shadow. The whole composition being in white marble, a wonderful effect of light is created. 'Undoubtedly

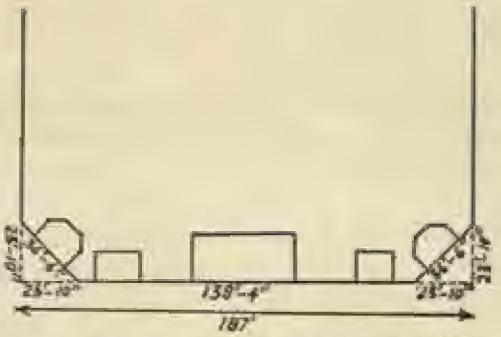


FIG. 32 *Forms and lines of the Taj Mahal*

much of its charm is produced by the quality and texture of the material used in its construction. The marble from Makrana is of such a nature that it takes on incredibly subtle variations of tint and tone, according to the changes in the light, thus picturing the passing colour of the moment. Especially is this noticeable in the shadows which on occasion are almost as delicately imperceptible as those cast upon clear water, soft and ethereal but still giving definition and depth. For every hour of the day and for every atmospheric condition the Taj has its own colour values, from the soft dreaminess at dawn and the dazzling whiteness at midday to its cold splendour in the moonlight, when the dome, thin of substance as the air, hangs among the stars like a great pearl. Yet none of these effects can equal those few fleeting moments when, softly illuminated by the brief Indian afterglow, it assumes the enchanting tint of some pale and lovely rose.'[115]

Light plays an important part in the total aesthetic effect of a building. The architect of the Taj not only selected white marble for all exterior surfaces but also so manipulated his material as to produce the best possible effects of light. The coloured inlay of the portal-dados, of the spandrels of the arches and the pilasters, closely associated with abundant white marble plain surfaces has its own unique colour effects, which marvellously present the structural forms. The decoration has been distributed

113. Benedetto Croce, *Aesthetic* (Douglas Ainsle) (London, 1959), p. 10.

114. 'It is the facile grouping, rhythmical disposal and skilful inter-relation of each part in the total unity that cause the appearance of this building to react on the aesthetic perception in a most inspiring manner.... the chief beauty....of this building lies in the complete lucidity and coherence of its external architectural effect....not a little of this is due to the high degree of perfection in its proportion, the simplicity, yet superb fluidity of its parts, and the elegancy, facility and golden cadency of it as a whole' (Percy Brown, op. cit., p. 109).

115. Ibid., p. 109.

very sparsely and there is an apparent predominance of plain surfaces. This lucid simplicity with a co-ordinate arrangement of simple forms is a significant factor of its aesthetics. Unusual lights bring out new forms and the architect fully understood these effects. He fully justified Le Corbusier's definition that 'Architecture is the masterly, correct and magnificent play of masses brought together in light.'[116]

The colossal height of the tomb, along with its pyramidal appearance which is obtained by the receding plinths, the square tomb and the bulbous dome, give it a soaring effect. It appears as if it is about to rise high into the sky. The pilasters surmounted by pinnacles, the tapering minarets, the decreasing volume of the dome culminating in a *kalasa* combine together superbly to give the Taj its ethereal quality full of lightness and grace.

The architect of the Taj fully understood these principles of aesthetics which he successfully incorporated in his creation. That these aesthetic norms served as the guiding lines in its planning as well as in its elevation brings home the fact that the Taj is more a work of art than of architecture—it is more a thing of beauty than a mere Mughal mausoleum! As if it were a painting which the painter has portrayed on the blue sky! As if it were a melody which the musician has personified in stone! As if it were a poem which the poet has created in marble —it is more the creation of an artist than a mere architect.

Another important aspect of the aesthetics of the Taj Mahal is the correction of the optical illusions which have been very ably understood and rectified. The human eye is a very deceptive organ; it does not see or interpret an object or a phenomenon as it really is but as it appears to the eyes, the interpretation being conditioned by so many factors, atmospheric, constancy and others. Thus the sky which is jet black in reality appears to be pleasingly blue because of the refraction of light through the dust particles which are present in the atmosphere. The pencil which is placed into water contained in a glass appears to bend at an angle just below the surface of water because of the travel of the light rays from a more dense to a less dense substance. Things are generally interpreted in terms of the setting in which they are seen; that is, they are perceived in terms of a variety of cues or environmental factors; for example, diagonal parallel lines appear to be unparallel if they are presented to the eye within a combination of horizontal and vertical lines.[117]

These optical illusions create great difficulties for the architect who necessarily has to take into account all such illusionary effects and suitably adjust for them in his creation. It is highly commendatory that such optical illusions were taken into consideration and forms were accordingly adjusted at the Parthenon as early as in the 5th century. B.C. Greek columns have an upward taper or diminution and an entasis or a convexity of silhouette or a swelling or curving outwards along the outline of the shaft. This was devised to correct the optical illusion on the vertical axis. Each angle column at the Parthenon is 1½" (3.75 cms.) thicker than the other columns and it is placed closer to the adjacent column, i.e., the distance between the angle column and its adjacent one is 5' 9" (1.75 metres) only while other columns have been placed 7' 11½" (2.43 metres) apart. Had they been of equal size and placed at equal distance the angle columns would have appeared thinner against the open sky. The effect of light and shade in the pillared construction has thus been counterbalanced and

116. Cf. Langer, op. cit., p. 96, quoted from Corbusier's *Toward a New Architecture*, p. 29.

117. N. L. Munn, *Psychology: The Fundamentals of Human Adjustment* (London, 1961), p. 588, fig. B; also see other illusions, pp.587-88; M. D. Vernon, *The Psychology of Perception* (Pelican, 1963), p 135, d. 27-28; E. G. Boring, *Foundations of Psychology*, pp. 15-16, pp. 225-26, p. 305, figs., 139 (a) (b), 140 (a), 141, etc.

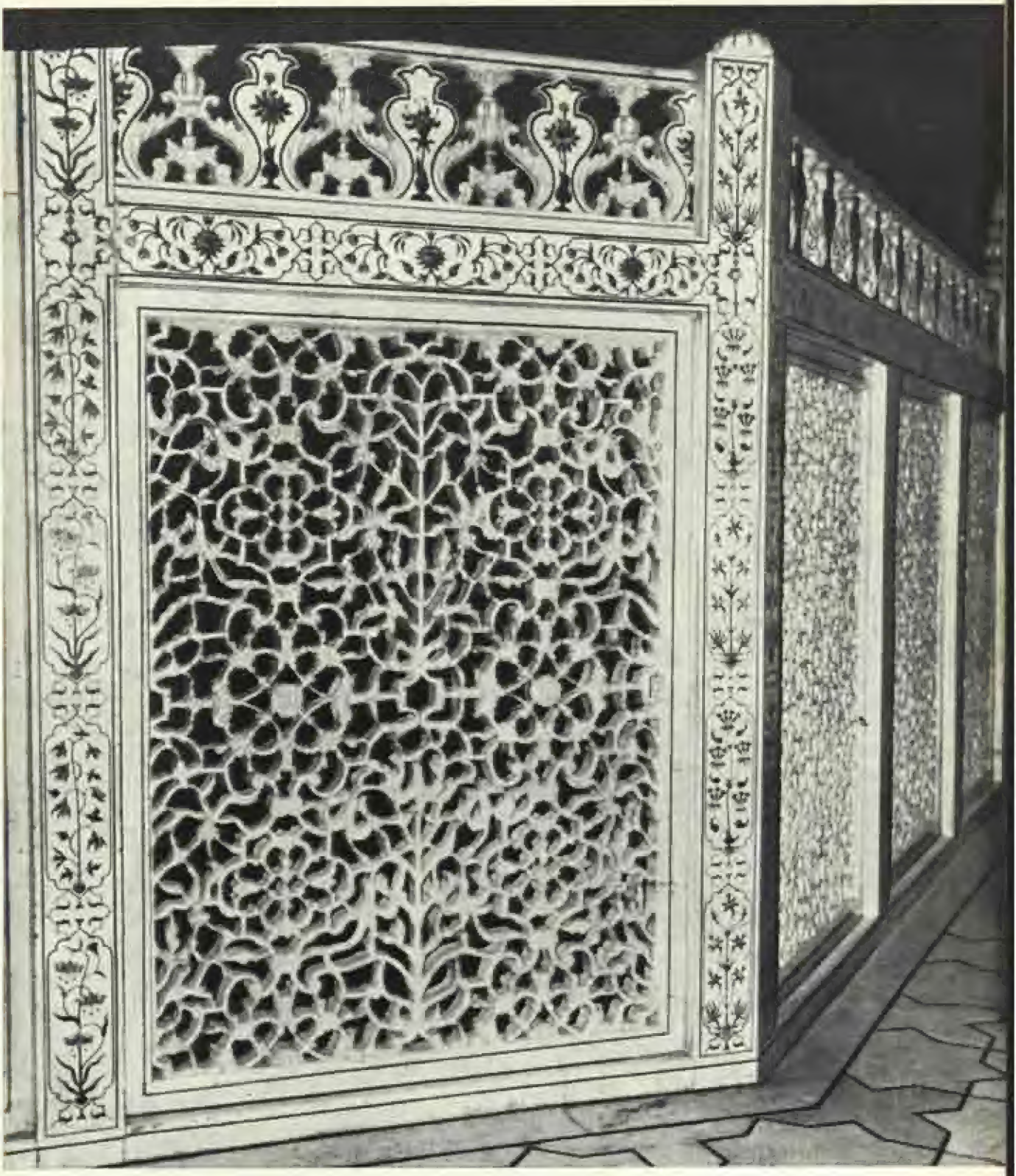
37. *Like the perfect form of a lovely woman.*
The Taj from the terrace of the gateway.

38. *Here she lies, Mumtaz Mahal, 'The Light of the Palace,' dreaming her eternal dreams. The cenotaph in the central hall.*

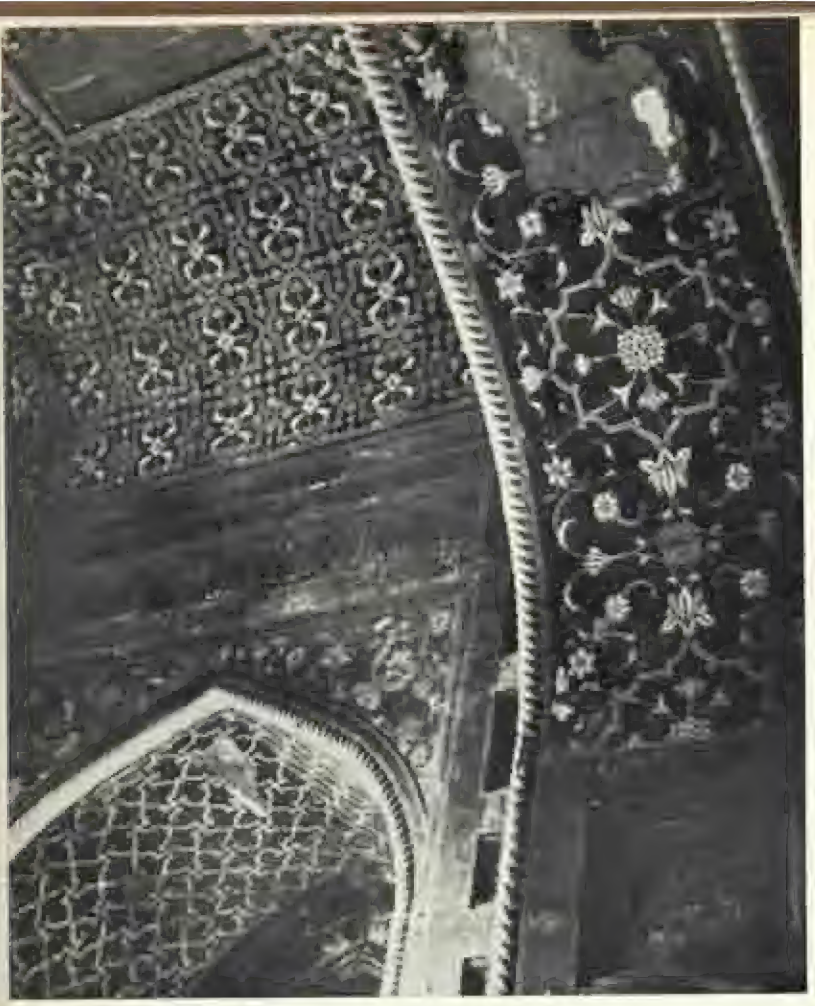
39. *Part of the inlaid and fretted marble curtain round the cenotaphs in the mortuary hall.*

40. *The central part of the exquisite marble fretted and inlaid curtain round the cenotaphs.*

41–42. *Fretted and inlaid marble curtain*



round the cenotaphs in the mortuary hall.



43. *Incised painting in the Mehman Khana, the Taj.*

44. *Detail of the incised painting.*

45. *Detail of the floral design of the incised painting in the Mehman-Khana.*

46. *Inlaid dados, portal, Taj Mahal.*

47. *Inlaid dado, mortuary chamber, Taj Mahal.*

48. *Slender minarets redolent of linear grace and the perfection of feminine beauty.*

49. *The Taj from the garden.*

the illusion has successfully been corrected. The columns are inclined inwards towards the top (i.e., the axes of angle columns lean inwards by 2¼" or 6.20 cms.) to correct the appearance of falling outwards.

The correction on the horizontal axis is of far greater importance. It is curious to note that the Parthenon has been constructed with a convex stylobate, architrave, entablature and pediment, inclining upwards by 2"-64 (6.65 cms.), the base also rising upwards in the middle to 2"-61 (6.60 cms.) in a length of 109 feet (33.22 metres). By giving this convexity, the optical illusions have been corrected and the temple is correctly posed. Had it been built accurately without these optical corrections, it would have appeared as if it were falling down.[118] Another correction has been done in the letters of the inscription which has been raised up on the building; they are larger in upper lines than in the lower so that they all appear of the same size when viewed from below.

There is no doubt that the architect of the Taj was not aware of the theory of illusions that modern science has revealed to us in the 20th century. It is also not possible, that he knew of the optical corrections made at the Parthenon—the two are so widely separated in time and space that an association between them cannot be established. But the indigenous builders of the Taj too fully understood the deceptive nature of the human eye. They had inherited the architectural traditions of the country and themselves had vast experience of architectural projects.[119] They knew that the reality and its perception and interpretation thereof differed. They knew how to combine details so as to present a project pleasingly. Illusions they fully understood and they utilised this aspect for the beautification of the Taj Mahal.

The Taj is not a pillared construction like the Parthenon; instead it has massive abutments and arches for its external effect. The plinth of the main tomb is 2' 10" (0.86 metre) high on an average.[120] But the height varies at different places, particularly the central point between two piers being in each case 0.5" to 0.7" (1.5 to 2.1 cms.) higher than the sides, which indicates that a convexity has deliberately been given to the plinth, not as a whole as in the case of the Parthenon but by instalments, i.e., in the centre of each arch. The facades are not exactly at a right angle with the plinth, but are slightly inclined; the degrees of inclination have however yet to be ascertained and this awaits a closer survey and scrutiny. The finial is a stupendous crowning feature which measures 32' 5½" (9.90 metres).[121] The architect fully anticipated the apparent size which a finial would present from such a great height. It has, therefore, been very ingeniously planned. The *kumbha*, which was to play a dominant role, measures 8' 9" (2.67 metres) in comparison to the base which is only 4' (1.22 metres). The uppermost portion above the crescent is likewise 5' 8½" (1.74 metres). Anything shorter or higher would have spoiled the whole effect. This demonstrates without doubt the ability of the Indian architect to reconcile the illusionary effects created by distance and light.

Sections in each facade have been demarcated by semi-octagonal pilasters that rise from the plinth of the main tomb and are crowned by beautiful pinnacles above the parapet. They have chevron patterns inlaid with black and yellow marble horizontally along their whole height. They appear to be fluted on each side though, as a matter

118. Fletcher, op. cit., p. 94.
119. Here no one or other set of workers is meant. Instead it is indicative of the whole guild of the artisans who effectively participated in its construction. It is the cultural heritage of the country which is responsible for bringing about such masterpieces.
120. As measured on the bench-marks 49 to 56.
121. Its replica as has been reproduced on the *chabutra* of the eastern *Mehmankhana* measures 30' 6" (9.19 metres), which means that the present finial is not original. As has been confirmed now, the original was replaced by Taylor in A.D. 1810.

of fact, there is no real fluting at all. They create a beautiful illusionary effect which the architect has very skilfully manipulated. Each such pilaster is flanked near its base by a panel on each side which has a similar chevron pattern inlaid in its border. While the chevron is horizontal on the pilaster it is vertical on the panels. The horizontal and vertical lines have a different dynamics and the axis of symmetry of the former differs from that of the latter. The two have been put together most harmoniously to create an illusionary and hence a beautiful effect.

The letters of the inscriptions around archways at the Taj Mahal, as in the case of the Parthenon, are generally supposed to become larger and larger above. On closer scrutiny, however, they are all found to be of uniform size. The calligrapher took recourse to a very simple device to correct the optic illusion. The letters have been inscribed densely at the bottom, with little plain surface in between; the inscription becomes more and more sparse as it rises with more plain surface in between the letters. It is this way that the visual rays have been correctly met with and an unmistakable uniformity obtained. The diminution of the plain surface has been accurately calculated and it is really creditable that the optical perspective of the letters has been reconciled with such minute precision.

CHAPTER 6

The Ornamentation of the Taj Mahal

WHILE the ancient Hindus chiefly relied upon sculpture and carving for interior and exterior ornamentation of their temples, the Mughals with their proverbial love for colour, resorted to almost all decorative schemes which had been introduced into India subsequent to its conquest by the Muhammedans. Of course, they also made use of the ancient Indian decorative mode of sculpture and carving, both incised and relief, but they did not confine their aesthetic expression to 'chiselling' only. For the decoration of their buildings they used glazed and enamel tiling, mosaic—which ultimately developed into the indigenous inlay—stucco and painting. Glazed tiling has been used chiefly as exterior embellishment while glass-mosaic and painting have been reserved for interiors. Stucco art has been used in interiors though exterior surfaces have also been ornamented with this technique and with equal success. Mosaic and inlay have been used in interiors as impressively as on the exteriors of monuments.

In India the mosaic of stone had been of two kinds from an early period. One was the tessellated style in which square or rectangular pieces of stones of different colours were assembled and arranged together so as to form a pattern. These pieces could be set together systematically on a plaster surface or on a stone slab background, the four edges of which could be made to border the mosaic pattern. The other was the inlaid style in which very thin pieces of semi-precious and rare stones were laid in sockets specially prepared in a red sandstone or marble slab.

The mausoleum in the Ashrafi Mahal apartments at Mandu, constructed about A.D. 1450 during the reign of Khalji Sultan Mahmud I, had in certain places patterns inlaid with choice stones.[122] Inlay had also been used at the Tower of Victory at Mandu. Curiously enough, the inlay style had also been adopted, almost simultaneously, in the Chaumukhi Jain Temple at Ranpur, in Sadri Pass in the erstwhile Jodhpur State, dedicated to the first Tirthankara Rishabhdeva.[122a] It was constructed by two Jain seths, Dharma and Ratna, during the reign of Maharana Kumbha (A.D. 1433-68).

122. Brown, op. cit., p. 66.
122a. See author's *Colour Decoration in Mughal Architecture* (Bombay, 1970), pp. 29-30.

The interior of this grand temple had been inlaid with mosaics of cornelian and agate.[123] Marble was available in the nearby regions and there is no surprise that the artisans, inspired by the mosaics in tiles which had now been well introduced into India, indigenously devised the mosaic in stone. No doubt, marble, to be perfectly presented, requires plain surfaces and it thus discourages profuse carving. It might have also led the workmen to resort to the mosaic of coloured stones in a marble background. These 15th century examples of mosaic in inlay disprove the theory that the inlay art was introduced into India by foreigners during the reign of Shah Jehan.

The Qila-i-Kuhna mosque of Sher Shah in the old Fort of Delhi, built about A.D. 1541, provides another example of mosaic with coloured stones. Pieces of white, black and yellow marble have been used with red sandstone[124] in its facade, chiefly in the central archway and both in tesselliated and in inlaid patterns. The success and the confidence with which the art has been used here demonstrate the attempt of the native stone builder to counteract and counterbalance the much professed tile-mosaic of the Islamic brand. Without being dazzling, it relieved the monotony of the red sandstone surfaces and provided a varied and thus a pleasant effect. It was a suitable substitute for the tile-mosaic which it could replace advantageously, including easier and less costly preparation, subdued colourfulness and an undiminished association with stone with which the Indian builder was traditionally accustomed.

The tomb of Humayun in Delhi, began around A.D. 1565, has inlaid ornament[125] chiefly on the pavement and the dados. Bold examples of this style are also met with at the Delhi Gate and the Jehangiri Mahal of Agra Fort and the Jami Masjid at Fatehpur Sikri. Inlay has been done here in red sandstone slabs with marble pieces.[126] Pointed stars have generally been used as design motifs.

White marble dado-panels, with beautifully inlaid borders, were first used in the second storey halls of the main gate and eastern and western false gateways at the tomb of Akbar at Sikandara, Agra, constructed between A.D. 1605 and 1612. Three such panels have survived the ravages of Time and Man at the western gateway. Each white marble dado is outlined with black marble linings to enhance its artistic effectiveness on a wall of red sandstone. The white marble slab is quite plain except at the edges which have been inlaid very tastefully in beautiful conventional floral patterns. Black marble and abri stones of a chocolate-grey-yellowish colour have been used for inlaying.

These marble dados it seems certain were inspired by the gorgeously bordered miniatures of the Mughals. Jehangir loved painting which was his most favourite pastime. He was a connoisseur of the miniature art. He greatly appreciated the beauties of nature and flower studies formed an important aspect of Mughal painting as represented by the paintings of Ustad Mansur,[127] who was one of the best artists in his atelier.

A great innovation was made during this period. The miniatures were gorgeously

123. James Tod, *Annals and Antiquities of Rajasthan*, Vol. I (London, 1920), p. 337, fn. 1; Tod observes, 'This temple is an additional proof of the early existence of the art of inlaying; Har Bilas Sarda, *Maharana Kumbha* (Ajmer, 1917), p. 86; Henry Cousens also seems to concur with this, cf. *A.S.I. Annual Report* 1907-8, pp. 205-12.

124. Brown, op. cit., p. 93; J. D. Beglar, 'Report for the year 1871-72, *A. S. I.*, Vol. IV (Calcutta, 1874), p. 74; J. Ph. Vogel (cf. *A.S.I. Annual Report* 1902-3, p. 78) maintained the opinion that this work is a later addition but the view is hardly tenable; the ornament undoubtedly formed an integral part of the original conception of the mosque.

125. Cunningham, *A.S.I.*, Vol. I, p. 233.

126. 'The pattern was first cut out on the red sandstone and the inlaying was done afterwards'—E W. Smith, *The Moghul Architecture of Fatehpur Sikri*, Part IV (Allahabad, 1898), p. 21.

127. Percy Brown, *Indian Painting under the Mughals* (Oxford, 1924), p. 86; also his Plate XXII, fig. 2.

mounted with beautiful borders (*hashiyahs*) in highly conventionalized floral patterns.[128] These borders were exquisitely and minutely painted. Separate painters who excelled in their art worked on these borders almost independently of the miniaturists; the border was thus treated as a complete work of art in itself.[129] Sometimes the border outshined the whole miniature. Generally speaking these borders borrowed their conventionalized leaf and floral patterns from Persian art; the curves and twists resembled more the arabesque scrolls of the Persian miniatures than the lotus and mango motifs of Ajanta and Bagh. The flowers also were typically Persian, such as tulips, iris and narcissus.

A special branch of miniature art had thus established itself firmly during the reign of Jehangir. It depicted plants and flowers; Chinese cloud-forms at times appeared on the background, sometimes to fill in the blank space; and it had beautiful borders gracefully framing the picture.

Such miniatures, because of their inherent beauty and superb aesthetic effect, greatly influenced the architectural decorator who translated them into stone. He utilised it chiefly on the dados of the buildings in white marble panels. A plant in the centre with leaves and flowers in natural bends and curves was generally carved. The *hashiyah* (border) on the other hand was inlaid with rare or semi-precious stones representing exactly the same colours which were used in the miniature. Curiously, the Chinese cloud-form was also copied by the mason from the miniature painting and we come across its liberal use on the dados of the Musamman Burj in the Agra Fort.

128. Raikrishnadas, *Bharat ki Chitrakala*, p. 92; Percy Brown, *Indian Painting under the Mughals*, p. 91: 'no miniature was considered complete unless it was surrounded by one of these highly ornamented borders in which bright-hued flowers, butterflies and birds were freely introduced....This form of embellishment while appearing first in Jehangir's reign, became a distinctive feature of the art under Shah Jehan.

129. Percy Brown, *Indian Painting* (Calcutta, 1927), p. 83.

Inlaid dados were used at the tomb of Itmad-ud-Daulah which was begun in A.D. 1622. Here, however, the design has been spread so densely on the panel that the floral border has become almost ineffective. It is here, therefore, that the Mughal decorator learnt the value of plain surfaces in marble construction. Here he picked up the idea that ornamentation should be sparsely distributed and inlay, to be properly presented, should be neighboured by a lot of blank space. Any profuseness is destined to spoil the effect. The inlaid border at the tomb of Itmad-ud-Daulah has lost its individual identity and has been completely submerged in the geometrical pattern which it originally meant to outshine.

Marble dados with inlaid borders have been used with better effect at the Musamman Burj. The centre of the dado is filled in with carved plants in natural bends and curves in two series one over the other. The border is inlaid with rare stones in pleasing tints in highly conventionalized floral patterns, exactly like the *hashiyahs* of a miniature painting.

The borders on the dado-panels at the Diwan-i-Khas in the Agra Fort, though also conventionalized, are far more refined and sophisticated. The space for inlay has been selected very carefully leaving adequate plain surfaces. Carved floral designs have been associated harmoniously with this inlay, which has been executed with an unmistakable artistic vision and a keen aesthetic sense. The selection of coloured stones, as much as the selection of patterns, deserves an unqualified tribute; nowhere does the embellishment appear to be extravagant or tiresome; nowhere does the inlayer appear to be over-enthusiastic, the defect from which he could have suffered most during the golden period. He was always as cautious as a painter is when he portrays a natural scene with the minutest precision.

The inlaid border at the Taj Mahal marks the perfect stage—from where the art could

only decline. The artist most judiciously distributed the inlaid borders on the dados in the interior hall, square chambers on the sides connecting the corridor running all round and the exterior portals. He removed at the Taj the defect of the dados of the Diwan-i-Khas: instead of using a double series of plants one over the other that spoils the uniformity and rhythm, he used at the Taj, e.g., on the dados of the octagonal mortuary hall, a single beautiful plant pattern composed of slender twigs, twisting leaves and bold flowers, emitting gracefully out of a classical Hindu *kalasa*. The carved pattern combines majestically with the inlaid border composed of a highly conventionalized pattern with set curves and twists. Very appropriate stones have been used to secure different colour tints in the pattern. The effect has been calculated with precision and due emphasis has been allotted to each inlaid flower and leaf. The border provides a delicate framing to the *kalasa*-plant; the latter with its dominant impression harmonizes magnificently with the former. The co-relation between the art of chiselling and the art of inlaying is most pleasing. Each dado is presented splendidly like a Mughal miniature! It is here that we again meet with the traditional stone-artist of India who chiselled the lively sculptures of Khajuraho in one art epoch and these wonderful bas-reliefs of the Taj Mahal in another. Each stands as a great work of art, unrivalled by any other example of its type in the world. There is no doubt that this aspect of Mughal architectural ornamentation received impetus from the contemporary art of painting; it is from this source that it derived most of its impressiveness and grace.

Inlay has also been used profusely on the marble curtain around the cenotaphs and also with equal skill on the cenotaphs themselves. The designs are highly stylized floral, typically Mughal. Inlay has been combined here with *jali*-work as gracefully as it has been used with carving on the dados. The most complicated phase of the art was arrived at, when the artist used at times as many as forty-eight tiny pieces of multi-coloured semi-precious stones for the execution of a single flower. The inlaid borders on the exterior dados of the four portals at the Taj are simpler than the work in the interior.

The inlay work on the spandrels of the arches in the interior as well as the exterior add magnificently to the overall aesthetic effect of the respective facades. Floral scrolls hang predominantly over the arch like a bunch of flowers over a rivulet flowing below; the superb impression created baffles the eye in the morning light as much as on the full moon-lit nights of October.

MUGHAL INLAY VERSUS THE PIETRA-DURA

It is in the Diwan-i-Am of the Delhi Fort, in the interior alcove, that the controversial inlaid panels have been used, one of which depicts 'Orpheus and his Lute.' This inlay of extreme delicacy, depicting some foreign birds and thin foliage, has been executed on dark black marble plaques.[130] They are the sole examples in India of this particular art.[131] The art is unmistakably Florentine. Its use in this Mughal structure led scholars, including Fergusson and V. A. Smith, to presume that it was pietra-dura which had been introduced into India, by Florentine artists led by Austin or Augustine of Bordeaux.[132]

The theory is wholly erroneous and is based on insufficient and faulty observations. The plaques are of 'intensely black and finely grained marble only procurable in Italy,'[133] unlike the greyish-black Indian marble. Not only the plaques but also the inlaid stones, the designs and the method are typically Italian, so much so that while restoring them work on a number of the plaques could only be executed in Florence. On the basis of

130. Sir John Marshal, *A.S.I. Annual Report* 1902-3, p. 26.
131. Ibid., p. 26.
132. Ibid., p. 26.
133. Ibid., p. 26.

these findings Marshall concluded that 'they were not only designed but actually executed in an Italian studio and afterwards imported into the country.... the arabesques on the other hand, which decorate the interspaces between the panels are of pure Indian style and Indian workmanship without a vestige of foreign influence.'[134]

Except for these plaques we do not come across any other specimen in Mughal architecture with such material or designs. The earlier examples of inlay of a highly sophisticated order strongly stand in favour of the technique having been developed in India indigenously. The inlay art, as we meet with at the Taj and the palatial apartments of Shah Jehan at Agra and Delhi, is as much Indian as is the carving work on the brackets of the so-called Birbal's Palace at Fatehpur Sikri. The designs are 'esssentially oriental in character; and even as regards technique it is more probable that it originated independently in this country.... it has lately received strong confirmation from the discovery at the Khalji mausoleum at Mandu of pietra-dura work in rougher and earlier stage than was hitherto known. Nor can the plaques in the Delhi throne referred to above be taken as evidence in this matter.... these panels were without doubt made in Italy itself and brought to India all complete so that they stand on quite a different plane to works of art produced on Indian soil and afford no substantial proof whatever of the extraneous influences to be looked for in the latter.'[135] Marshall concluded that 'the presence of these Italian plaques demonstrates trade connections but nothing more.'[136]

Marshall's view was confirmed by Signor Menepatti, a Florentine mosaicist, and a practical expert on Italian marbles,[137] whose services were utilised by the Department of Archaeology when some of these broken and missing panels were restored between A.D. 1906 and 1909. Gordon Sanderson too fully concurred with Marshall's view that these plaques were imported from Italy; while the restoration work was carried out Indian greyish-black marble was used 'instead of the original black Italian marble.'[138] Many of the inlay stones were also brought from Florence.[139] He observes, 'I am informed by the Director-General of Geological Survey of India that true black marble is practically unknown in India, although a dark grey variety is found at Bhanslana in Rajputana.'[140]

Fergusson committed an error when without studying the different stages of its development he observed, 'in the early part of the 17th century Italian artists, principally apparently from Florence, were introduced into India and taught the Indians the art of inlaying marble with precious stones.'[141] This presumption goes unsupported. The gross under-estimation of the art capabilities of Indian workmen seems to have been based on the bias with which many Europeans suffered in the 19th century. His hypothesis that there is no specimen of 'inlay' at the gates of Akbar's tomb[142] is erroneous; we come across inlay specimens on a perfectly developed scale at these gates as has already been discussed. The earlier examples of indigenous inlay at Fatehpur Sikri and the Qila-i-Kuhna mosque at Delhi of the 16th century, and at Mandu and Ranpur temple of the 15th century, stand strongly against the faulty hypothesis that the art was introduced into India all of a sudden in the 17th century.

Fergusson's fanciful presumption that the mosaic of 'Orpheus' was executed by Austin who was employed by Shah Jehan[143] has not been corroborated by records. European travellers, including such an accurate

134. Ibid., p. 27.
135. Sir John Marshall, *A.S.I. Annual Report* 1'04-5, p 3.
136. Ibid., p. 3.
137. Ibid., p. 3.
138. Cf. *A.S.I. Annual Report* 1911-12, p. 21.
139. Ibid., p 21.
140. Ibid., p. 21 ftn.
141. Cf. *History of Indian and Eastern Architecture* (London, 1876), p. 588.
142. Ibid., p. 588 ftn.
143. Ibid., p. 588 ftn.

observer as Peter Mundy and including of course the French travellers Tavernier and Bernier, do not make any such mention. They would have been proud to proclaim it, had it been a reality. Both the Frenchmen wrote of Austin as a jeweller and as an expert in counterfeiting precious stones. Austin in his own letters mentions himself only as a jeweller and as an engineer, expert in counterfeiting precious stones and making gold and silver articles; he never alludes to himself as an inlayer in marble.[144]

The panel, it is certain, was imported as a whole in the same way as the Aleppo glasses were imported for ornamentation at the Shish Mahal in the Agra Fort. It is incredible and fantastic to hold the view that Italian artists gave instructions regarding the new art to Indian workmen. The attempt to decry Indian indigenous skill and artistic capacity is too garibaldian to hold. Fergusson's distinction between 'adopting' and 'adapting'[145] is equally defective; the art of inlay developed on indigenous lines, slowly and gradually, stage by stage, which can be traced and any 'adopting' or 'adapting' of the Italian art features is not admissible.

V.A. Smith stood by Fergusson and maintained that Mughal inlay had its origin in Italian pietra-dura; he writes, 'The Florentine pietra-dura inlay, a revival of the ancient Roman opus sectile, first appears according to Major Cole in the Fabbrica Ducab built by Ferdinand I, Grand Duke of Tuscany in 1558. The earliest certain Indian examples being considerably later in date and identical in technique a strong presumption arises that the art must have been introduced into India from Italy. There is no doubt that the Mughal sovereigns freely entertained artists from Europe as well as from most parts of Asia. The presumption is not rebutted by the obvious fact that the designs of the Mughal work are essentially and in the main Persian because the ordinary Indian practice is to transpose foreign importations so to speak into an Indian key. Persian designs were readily assimilated but in the 17th century nobody in India cared much for outlandish European forms or wanted to have them.'[146]

It seems that the earlier 15th and 16th century Indian examples were either unknown to him or it is possible that under the influence of over-whelming bias he chose to overlook them. The stages of indigenous development from the Ranpur Temple to the tomb of Akbar are perfectly clear and the belief that specimens of Mughal inlay were executed by Florentine artists under the patronage of the Mughal court is hardly convincing.

Sir George C. M. Birdwood maintained a multi-faced theory. On the one hand he asserted that Austin de Bordeaux introduced pietra-dura at the Taj and on the other he remarked, 'while Florentine in origin and style the designs have a thoroughly local character of their own and.... adhere strictly to the principles and methods of Indian ornamentation.'[147] At one place he writes: 'The use of inlaid stone in true mosaic work by the Mogols in India was principally due to the revival of the ancient art in Italy. The Italians of the Renaissance developed two distinct forms of inlaying in stone, the Roman mosaic of modern jewellers which may be compared to the opus minus vermiculatum (composed of very minute and delicate tessellae) and the Florentine composed of thin slices of different coloured stones chiefly quartzose cut to the shape of form they are intended to represent, the petal of a flower, the wing of a bird or whatever it may be and set in white or black marble with cement.... It was

144. Cf. 'Four Letters by Austin of Bordeaux', *Journal of the Punjab Historical Society*, Vol. IV, No. 1 (Calcutta, 1916); for details see author's paper entitled 'Augustine of Bordeaux and his relations with the Mughal Court (1612-32),' published in the *Quarterly Review of Historical Studies* (Calcutta), Vol. VIII, No. 3.

145. Cf op. cit., p. 589.

146. *A History of Fine Art in India and Ceylon*, (Bombay, 1969), p. 438.

147. Sir George C. M. Birdwood, *The Industrial Arts of India* (London, 1880), p. 209.

this Florentine form of mosaic in pietra-dura which was used by Austin de Bordeaux in the decoration of the glorious Taj Mahal.'[148] In another reference he refutes his own version and comments, 'The mosaic work of the Taj is.... not an exotic art but of indigenous development and strongly racy of the soil from which it immediately sprung. It is not in the least Florentine but strictly Indian of the Mogol period and the product not of the knowledge and taste of any foreign artists in the employment of Shah Jehan but of the whole history of India and the East.'[149]

E. B. Havell was not prepared to admit any Florentine trace in the Mughal art of inlay and wrote, 'on technical grounds it is difficult to understand why a French goldsmith and jeweller should be made responsible for inlaid stone work similar in technique but totally different in design to Florentine pietra-dura.'[150] He maintained that the solitary instance at the Diwan-i-Am of Delhi Fort must have been imported. He strongly believed in the inherent art capabilities of the Indian workman and held the view that the art was an indigenous development. Percy Brown also agreed that this plaque was imported from Florence and 'as a choice work of art was incorporated by the Indian artisan in his ornamental scheme just as a piece of exotic brocade might be included in a patchwork quilt.'[151] In his opinion, the foreign influence in medieval India 'was confined almost entirely to the field of the minor and applied arts, the effect on the architecture being of little consequence owing mainly to its inherent constitutional vigour.'[152] J. Burton Page also concurred with this view.[153]

148. Ibid., pp. 214-15.
149. 'Decorations of the Taj at Agra,' *Journal of Indian Art*, October 1885, pp. 61-62, as quoted by Moinuddin in *The Taj and its Environments* (Agra, 1924), pp. 29-30.
150. E. B. Havell, *A Handbook to Agra and the Taj* (Calcutta, 1912), p. 141.
151. Percy Brown, *Indian Architecture*, Vol. I, p. 105.
152. Ibid., p. 105.
153. Cf. *Splendours of the East*, p. 134.

It is thus absolutely without technical and historical foundation to designate the inlay work at the Taj and at the palatial mansions of Shah Jehan at Agra and Delhi as pietra-dura which is, therefore, a misnomer when applied to the inlay art as seen in Mughal architecture.

INCISED PAINTING AT THE TAJ MAHAL

The Mughal court from the time of Akbar to Shah Jehan gave patronage to almost all methods of architectural painting as is seen in the monuments of Agra and Fatehpur Sikri. There we meet with specimens of encaustic, fresco-buono, fresco-secco and stucco-lustro techniques. Marble as well as plaster surfaces have been used for these paintings. Sometimes the art was directed into strange channels. In the Khwabagh at Fatehpur Sikri, for example, we meet with an unknown method of painting. While in the interior of this building the pigments are of the thinness of paper, the floral patterns painted on the exterior columns of the uppermost storey have no intonaco or background coat whatsoever. The stone surface has directly received the colour, chiefly chocolate, and has completely absorbed it, so much so that the colour has no separate entity at all. In this process the artist dexterously utilised the white natural spots of the stone to represent flowers or other features with slight additions. The complete absence of the intonaco on the columns of the Khwabagh is indicative of an ingenious development of the technique and makes this painting a superb work of art. It confirms Abul Fazl's statement that 'the mixture of colours has especially been improved. The pictures thus received a hitherto unknown finish.'[154] This is neither fresco nor tempera but something else, the execution of which did not require any plaster background. The paints used are neither water-colours, which could not have

154. *Ain-i-Akbari* (Blochmann), Vol. I (Calcutta, 1873), p. 107.

survived on the exterior columns always exposed to sun and rain, nor encaustic because they do not have the resultant lustre or any trace of it. The true nature of the colours used on the columns of the Khwabgah has not been ascertained and remains a mystery like so many other features of Mughal art.

While so many complicated methods and a wide variety of colours—with an almost invariable overcoat of costly gilding—were used in mural painting under court patronage, contemporary folk-art developed on extremely simple lines. It was mostly 'intaglio,' or incised and was composed of two simple colours—a white used on a dark red background. The former was obtained from *safeda* (white lead) and the latter from *hirmich* (Hirmizi, red earth), the common and cheap country pigments which are in use in folk-art from ancient times. Most probably this folk-art painting was executed by the tempera or the fresco-secco method. It has first been used, almost on an experimental basis, at the tomb of Akbar at Sikandara, in the three open chambers at the back of the western false gateway. Highly conventionalized florals and arabesques have been used. The art proved to be as beautiful and as stable as was the complicated encaustic painting of the vestibule in the same mausoleum. The simplicity of the pigments used, the success of the technique with which it could be executed and its lucid aesthetic impression which moved the beholder led the court artists of mural painting to adopt it on an elaborate scale with some of their own colours at the tomb of Itmad-ud-Daulah.

In this technique a thin layer of colour-pigment is laid over the white plaster surface. A floral or conventional design is then drawn on the colour surface, according to which the colour layer is scrapped off, thus exposing the white plaster underneath, now seen only through the scrapped-off design. It is thus 'incised painting' which ensures a delicate play of light and shade and is as beautiful as incised stucco. It has chiefly been used at the tomb of Itmad-ud-Daulah on the borders of the alcoves, along with the *guldastas* and on the ceilings.

This art resembles the Italian sgraffito work to some extent, though India did not necessarily borrow the idea from the Italians. In all probability it was developed independently by the Mughal painters, who through a long course of architectural embellishment with the help of plaster and colours, might have devised it independently. W. H. Nicholls did not correctly compare the two arts—the Italian sgraffito and the Mughal incised painting, examples of which were probably not known to him.[155] The Mughal incised painting is quite different from the incised stucco art in technique as well as in material. It is much simpler, being mostly composed of two colours only, one of which is almost invariably the white of the entire plaster surface.

The most developed stage of this tech-

155. Cf. *A. S. I. Annual Report* 1903-4, pp. 25-26. 'The incised plaster work commonly found in Mughal buildings in inscriptions and medallions reminds one of the sgraffito work of Italy....But the Mughals obtained the coloured ground of their sgraffito by painting in the colour after the surface of the plaster had been carved, while the Italian method consists in laying a distinct layer of coloured plaster on the wall, covering the coloured coat with a skimming coat and then cutting and scraping away the skimming coat so as to show the colour underneath. Thus while the Italian sgraffito lends itself to a broad treatment owing to the difficulty of laying the different colours of the colour coat in such a manner that the right colour will appear in exactly the right place when the skimming coat is scrapped away, by the Mughal method patterns involving the most intricate arrangement of colours can be worked. The advantages of the Italian method are two-fold, first because when once the sgraffito is executed it is much more lasting and can be washed and cleaned: secondly because the restrictions on the design which the process entails are conducive to a broader and more harmonious effect, while the speckled appearance and glaring contrasts of colour which the Mughals sometimes produced—as for instance, in the vestibule of Akbar's tomb at Sikandrah—are rendered impossible.' Nicholls thus alludes only to the examples of the Mughal incised stucco.

nique is found at the Taj Mahal, in the mosque and the Mehmankhana, distributed in highly stylized patterns along their whole interiors, from dados to the ceilings. Here again only two colours have been used, a *hirmichi* red on a white background which is allowed to show magnificently through the scrapped off leaves, flowers and the outlines. The tiny curves of white thus blossom exuberantly on a red ground—portions of the background have thus artistically been brought to the foreground and the foreground recedes into background! It is hardly believable that such a great aesthetic effect could be obtained, on such a large scale, by the use of these two simple colours only. This has been made possible by the technique, the motifs and above all the artists' skill in distributing the designs judiciously and harmoniously; all these three aspects of the art deserve credit for the exquisite effect produced by this architectural decor. The walls glitter as they do at the Shish Mahal; the principle of light and shade has been utilised to work wonders. Obviously a plain painting could not have brought about this miracle of artistic expression.

That folk-art composed of essentially Indian pigments like *safeda* and *hirmich* has been employed in such a fine monument of the Grand Mughals and that too with such great emphasis is as much illustrative of the Mughal love of the beautiful as of the patronage which was unprejudicially accorded to a common form of art. It represented the popular side of the Imperial regime; the Mughals had accommodated themselves heart and soul in the Indian environment. They wore Indian dress, they ate Indian dishes. They observed *Jharokha-darshan* and *Tula-dan;* they celebrated Diwali, Holi, Raksha-bandhan and Dassehra, the popular institutions of the Indian masses. They performed *tilak*. They gave considerable impetus to Indian music, literature, arts and architecture. They did not despise the cultural side of their people; instead, they accorded due cognizance to it and, if it was conducive to their artistic ideals and did not infringe on their political aspirations, liberally patronized it.

CHAPTER 7

The Story of a Second Taj and Other Mysteries

ACCORDING to a popular legend, Shah Jehan decided to construct another Taj Mahal in black marble on the other side of the river Jumna and to connect the two by a bridge (Fig. 33). It has been recorded almost contemporarily by Tavernier: 'Shahjahan began to build his own tomb on the other side of the river but the war with his sons interrupted his plan and Aurangzeb who reigns at present is not disposed to complete it.'[156] Later gazetteers and guide books mention this story almost invariably. Particularly Moinuddin attached the greatest credence to the legend and went to the extent of pointing out traces of the unmatured plan on the other side. The Mehtab Burj and the wall which adjoins it opposite the Taj Mahal are generally said to be the foundations and remains of the proposed plan. This has been accepted even in the most recent times. J. B. Page spoke of it affirmatively: 'Had the Emperor at first intended this to be his own tomb he would have occupied the central position. We know that he intended his own tomb to be of a similar design to the Taj but in black marble, in a garden on the opposite side of the river and connected to the tomb of his consort by a bridge; there are indeed traces of the foundations for such a building across the Jumna.'[157]

This is a misconception; the idea belongs more to fiction than to history. Tavernier seems to have recorded a rumour. His own account is self-contradictory and is not reliable in view of the facts and figures of history. He was in India first on his second voyage to the East in A.D. 1640-41 when the Taj was still under construction and a

156. *Travels of Tavernier* (V. Ball), Vol. 1 (London, 1925), p. 91.

157. J. B. Page, *Splendours of the East*, p. 162.

FIG. 33
A conjectural view of a second Taj Mahal

replica on the other side of the river could not have been begun. He was again at Agra in August/September 1665. The Taj was completed in A.D. 1648. Obviously, if any construction had been undertaken on the second Taj, it could only be dated after A.D. 1648 and much before 1658 when Shah Jehan was finally deposed and imprisoned. Tavernier falsely connected the three distinctly separated events: the supposed construction of a second Taj about A.D. 1648, the war of succession in A.D. 1658 and the allusion of the ruling monarch Aurangzeb in A.D. 1665. The idea thus seems to be too fanciful and romantic to be historical. Lahauri and Kambo, the contemporary Persian chroniclers, do not make the slightest mention of such a plan. The traces which are identified as the foundations of the second Taj can least be associated this way. The masonry structure which extends to the west of the Mehtab Burj is not a foundation but the enclosing wall of the Mehtab Bagh which was founded by Babur. Plinths of some pavilions, water-channels, tanks, loose brackets, stone slabs, and other features are distinctly traceable in the adjoining area. As a matter of fact, they mark the site which was occupied and relaid as char-baghs by Babur and his nobles as his memoirs record. The Mosque of Humayun, which bears the date A.D. 1530, is in its close vicinity. The *Gyarah Siddi* along with its beautiful *baoli* in the neighbourhood is another link in the same chain. The char-baghs extended to the Rambagh. The Mehtab Burj is only the south-east tower of the Mehtab Bagh, the other three have crumpled. It cannot be compared with the north-east tower of the Taj, which is of far larger dimensions. The Mehtab Burj is single-storeyed, crowned by a *chhatri* and stands hardly 12 feet (3.66 metres) above the river. The north-east tower of the Taj, on the other hand, is multi-storeyed with a complex arrangement of rooms and verandahs and stands 43 feet (13.11 metres) above the river. The two widely differ in plan as well as in elevation and by no stretch of imagination can the former be considered a replica of the latter.

The irregular position of the cenotaph of Shah Jehan as compared to that of Mumtaz Mahal which occupies the exact centre of the hall is said to be a proof of this assumption. But this position is similar to that at the tomb of Itmad-ud-Daulah, on the ground floor as well as in the upper hall. Thus, while the sarcophagus of Asmat Begum is in the exact centre, that of Mirza Ghiyas Beg occupies an unsymmetrical position to its right (Figs. 22 and 23). But this irregularity of position is not easily discernible as the cenotaphs there are not enclosed within a curtain, while at the Taj Mahal the passage within the enclosing curtain is practically obstructed by the cenotaph of Shah Jehan and immediately attracts notice to the irregular positioning. It is only due to the presence of an enclosing curtain around the cenotaphs at the Taj that the irregularity is perceptible while it is not noticed easily at the tomb of Itmad-ud-Daulah. In either case, the wife preceded the husband to her heavenly abode; in either case she lies buried in the exact centre. The bodies according to Islamic Law are buried with their faces towards Mecca and legs towards the south, and the husband is placed on the right hand side of his wife. The interpretation thus that the cenotaph of Shah Jehan was not meant to be placed here appears to be superfluous. The story of a second Taj is based on mere hearsay and seems to have been given currency by over-zealous guides with a view to multiply the magnitude of its magnificence as if that were needed!

THE BASEMENT CHAMBERS AND A PROBABLE THIRD GRAVE

Two staircases on the northern side of the red sandstone plinth of the Taj lead below into the basement chambers which are seventeen in number and have been laid out

in a line on the riverside of a narrow through-corridor (Fig. 34). The rooms and corridor are of arcuate construction in brick and plaster, with stucco and painting ornamentation, distributed aesthetically on the soffits. At the extreme points on both sides there are doors sunk in the northern wall. They were blocked up permanently and securely with thick masonry at some unknown date, but without doubt with some well-calculated purpose. As may be surmised, the set on the northern side could have been repeated on the sides below the marble structure, with a rotating corridor, chambers and probably a crypt in the centre —all being interconnected.

FIG. 34
Basement chamber of the Taj Mahal

This crypt would have contained the third and the real set of graves. The custom of providing cenotaphs or replicas had been followed by the Turks and the Mughals alike as we meet with this practice at the Sultan-ghari and the tomb of Iltutmish at Delhi and at the tombs of Sadiq Khan and Akbar at Agra, as has already been discussed above. The tomb of Akbar has three tombstones, one on the grave and two as cenotaphs. The tomb of Itmad-ud-Daulah and the Chini-ka-Rauza too had three tombstones each. The lowest of the former was contained in a crypt which was originally accessible from the riverside and has now been completely blocked up. The crypt in the latter case is still extant, though the graves have been destroyed.

These examples indicate that the Mughals generally liked to provide three tombstones in a mausoleum. At the Taj we have two at present. The third and the real set of graves is traditionally claimed to exist. It is only in these underground vaults that the third set could have been placed. The doors in the basement corridor no doubt exist and must have originally given entry to some underground arrangement of chambers and corridors. Though they are now impregnably blocked, their existence lends weight to the legendary version. It may be conjectured that the crypt which might contain the grave of Mumtaz Mahal and the surrounding passages were closed up at a later date to give additional strength to the base which has to support such a huge load above. No such step, however, is recorded to have been taken during the British period from A.D. 1803 to 1947. Nor could the attempt have been made during the turbulent, almost anarchic, 18th century when Agra, the Darul-Khilafat of the Great Mughals, changed hands from the Mughals to the Jats and from the Jats to the Marathas, one after the other. It is possible that the doors were blocked up in A.D. 1652 when Aurangzeb noticed cracks in the seven underground vaults and conducted certain repairs.

On a close scrutiny it can be seen that no additional strength would be given to the structure by the repairs which have been carried out. It is inconceivable that the doors were blocked up and that too with such great care and precision with a view to provide some additional support to the huge mass above. No fraction of the load rests on the sills of the doors, the whole being passed down on an efficient arcuate system and hence their filling would be superfluous from this point of view. Unless the blocked up doors are opened and access is made possible into the closed down passages nothing can incontroversially be deduced. It can however be assumed at present that the original grave of Mumtaz Mahal is somewhere in this underground arrangement of corridors and chambers, possibly at their nucleus and the whole was closed down secretly during the reign of Shah Jehan himself, for a purpose which has yet to be discovered.

THE TAJ IS SINKING[158]

When the architect of the Taj Mahal was out in search of some suitable site for its construction, he had some fundamental conditions in mind: that the plot of land where the grand edifice would be erected should be on the river bank, just near water to provide it with a beautiful setting and to give it an unalterable, undiminishable, inherently aesthetic character; that it should be situated at a point where the dangerous thrust of water would be at a minimum and that it should be placed so as to give a correct orientation to the Mosque which formed an integral part of the whole project —without at all jeopardizing its symmetry. The site on which the Taj presently stands marks a point where the Jamuna takes a sharp curve with the least thrust of water and accurately faces the east. It thus fulfilled all the three requirements and was consequently selected.

The architect was fully conversant with his materials and knew well how to use them to the best advantage. Mortar was specially prepared for the purpose with perfectly slaked lime and *vajra kankar* in equal proportions along with some country ingredients like *gur, urd-pulse, batashe, besan, rumi-mastagi, belgiri*-water, jute and gum. The cementing agent which had thus been prepared was very strong and enduring. The brick was reduced from the standard Mughal size of 8" x 7½" x 1¾" to 7" x 4½" x 1" so that the *vajra* mortar could occupy a greater cubic volume of the construction than that which could be filled with the brick. Perfectly baked bricks of first class quality were selected. They were fed into hot fat, mixed with some chemicals, which were absorbed into the porous body of the brick. This thin, almost imperceptible, overcoat made the bricks adequately waterproof.

The sepulchre was built at the edge of a stylobate which originally sloped into the river (Fig. 35). A study of the river bank downstream as far as the Lal Mahal confirms this contention. Very deep foundations were dug which extended right down to rock level. As was the Mughal custom, the system of well foundation was adopted on a very refined scale. The plans and sectional diagrams, which are no longer available, must have been prepared beforehand with the utmost care, localising the load and the distribution of the weight on the massive piers. The foundations were raised in accordance with the superstructure so that each massive pier could rest on one series of wells which were connected together by means of strong arches. Each well is composed of a massive circular wall of kakai bricks and lime mortar of great strength with axles and spokes placed in it at regular intervals along the whole depth. The core was filled with rubble mixed with mortar. The space between the wells was filled with solid masonry composed of stones and lime. The load was evenly distributed and passed down to the foundations without the slightest apprehension of lateral thrusts. Thus, every care irrespective of cost was taken to provide the huge mass above with a firm and compact base, which originally rose to a height of 16 Shahjahanim yards, equivalent to 43 feet (13.11

FIG. 35
Well foundation of the Taj Mahal

158. Published under the title 'The Taj in Danger' in the *Sunday Standard* of April 7, 1968.

metres) from the Jamuna level. While each massive pier carrying the huge load above it rested directly on a series of wells, the whole was so bonded together as to make it a perfectly compact body. The well-foundation had its advantages near the water in as much as it minimised the danger from displacement of soil, uneven distribution of the weight, and unequal settlement.

To counteract the inevitable thrust of water, wells were also piled towards the riverside outside the foundations at close intervals. The wells are in series of three, seven and seventeen and concentrate in large numbers near the north-west corner of the building, i.e., the Basai Burj where the apprehension of the dangerous thrust of water was the greatest. They have also been distributed, though sparsely, along the whole northern side of the building. Each such external well is also composed of a massive circular wall of kakai bricks and strong lime mortar with wooden (Deodar) axles and spokes. The core is filled with mud and sand. This well-foundation is a typical feature of Mughal architecture, used almost invariably in all buildings constructed on the river bank, e.g., at Rambagh, Chini-ka-Rauza, the tomb of Itmad-ud-Daulah and others. The greatest advantage of this expedient on the external side is that it faces and neutralises the thrust of water before the latter can do any harm to the building; it counteracts the thrust almost like a living organ as it remains afloat intact, even when it is dislodged at its base. Overlaid with mud and sand which the river deposited every year these wells provided an invincible shield to the building.

The Mughal architect aimed at giving the maximum strength and stability to the tomb and worked out the minutest details with utmost precision. He was fully conscious of the magnitude of the great lateral thrusts and intensities of pressure of the huge weight of this great mass of masonry centred round the tomb measuring 997 feet (303.89 metres) long, 373 feet (113.69 metres) broad and 285 feet (86.87 metres) high. It is bewildering to note that only the dome at its springing weighs 12,000 (12,192.56 metric tons) tons![159] The walls of the cenotaph hall carry a heavy load at 7.9 tons (8.02 metric tons) per sq. foot, almost twice the safe limit of 4 tons (4.06 metric tons) of the strongest construction of modern architecture![160] The architect of the Taj might not have calculated the weight so accurately as he was not a theoretician. But as a practical expert in his art he had all these details in constant view and uniformly distributed the load throughout according to the principle which is known as the 'Cone of Incidence' in modern architecture. The load is not allowed to concentrate at any one point or to rest unevenly. Extraordinarily massive piers and vaults were constructed to support this heavy load and to pass it down safely to the solid pile foundations. An efficient system of headers and stretchers, reinforced with iron clamps, was resorted to, to withstand the bursting effect of the heavy load. With the very best quality of the bonding material the architect successfully combated the disruptive tensile stress. A very judicious use of the arcuate system has been made to span the spaces in conformity with the plan of the sepulchre, while all the time the aesthetic considerations were kept constantly in mind.

It is not known how in spite of all these precautions and care, dangerous cracks and leakages developed in the substructure just four years after its completion. Aurangzeb in his letter to Shah Jehan in A.D. 1652 mentions these cracks which he noticed in the seven arched underground vaults.[161] Some defects were discovered about the

159. Final Report of the Advisory Committee on the Restoration and Conservation of the Taj Mahal at Agra, 1942 (Delhi, 1942), p. 8, it comes to 27,105,813 lbs. Cf. Ibid., p. 18 (Appendix E).
160. Ibid, p. 7.
161. Ibid., p. 26 (Appendix-C) quoted from *Adab-i-Alamgiri*, p. 29.

50

51

52. *Where love speaks in the language of stone...*

50. (Previous Plate). *A memorial of matchless beauty...*

51. (Previous Plate). *Symbol of an Emperor's immortal love.*

53. *Enshrined in stone, 'her eternal summer shall not fade...'*

54. *When day is done, and shadows fall...*
The Taj by evening's fading light.

same time in the dome. Though thorough repairs were undertaken, the nature of the cracks could not be discovered.

Captain Joseph Taylor conducted repairs on the Taj next between A.D. 1810 and 1814.[162] The cracks were again noticed to have developed to dangerous proportions and the attention of the Government was drawn to the fact. J. W. Alexander, Executive Engineer, P.W.D. Agra Provincial Division, was consequently assigned in A.D 1874 to carry out the necessary repairs. Cracks however again developed and in pursuance of the comments in the *Hindustan Times* of 7th and 11th November 1937, Sir Ziauddin Ahmed took up the matter in the Assembly. An Advisory Committee on the restoration and conservation of the Taj Mahal was consequently set up. An exhaustive survey of the monument with particular reference to the damage was undertaken. A keen attempt was made to assess the amount of danger which the building was faced with, and the nature of the cracks. Permanent bench-marks were engraved on 104 points to facilitate rechecking of the levels every year as was finally recommended. Extensive repairs followed.

Some very important facts resulted from this survey. It was discovered that the plinth of the mausoleum on the northern or the riverside is lower than on the south by 1-11/25" (about 3.5 cms). The slope was recorded to be gradual and symmetrical. No cracks in the exterior wall were then noticed. Hence, any subsidence was ruled out by the experts who explained the difference in the plinth level as either having been made purposely or due to the inaccuracy of construction.[163]

Such an inaccuracy of construction is inconceivable at the hands of the Indian mason who worked in accordance with well-tried and perfectly evolved ancient architectural canons. His extremely simple tools, the *sutra-astakam*, could ensure most scientific construction brought about with greatest precision. Any defect on the horizontal or the vertical line is not met with elsewhere in his creations. A difference of level to the extent of more than an inch could never have escaped his notice. He prepared pavements of such a large span with the help of a water-level which eliminates possibility of any such defect on the horizontal axis. There seems to be no purpose in providing a slope to the plinth northwards either. Gargoyles were provided on all the four sides of the plinth which shows that the rain water was intended to be thrown off on all sides evenly. The cracks were not perceived on the exterior wall. But they were definitely present on the second storey vaults of the marble structure and, on a much larger scale, in the underground vaults below the northern side. The long series of these cracks in the underground vaults may be due to the crushing of the lime on account of the excessive weight, or as seems more probable, this may be due to the sinking of the whole structure towards the riverside. Such a sinking would shift the load out of balance slowly and gradually and the unequal settlement would crack the weak points, particularly the soffits of the vaults and arches, which is actually happening in the underground chambers.

The report included another hair-raising discovery, i.e., the minarets were found out of plumb. The displacement of the central axis along its elevation, i.e., the differences between the centres of their bases and tops were recorded in A.D. 1940 as follows:

South-east minaret — 4.5" (11.25 cms.)
North-east minaret — 1.9" (4.75 cms.)
North-west minaret — 1.4" (3.6 cms.)
South-west minaret — 8.5" (21.25 cms.)[164]

162. Major William Thorn, cf. *Memoir of the War in India* (London, 1818), p. 209, mentions that about three lacs of rupees were spent on the repairs of the Taj Mahal. Taylor replaced the finial, as it came to be known, when it was taken down in A.D. 1873-74 for regilding, the words 'Joseph Taylor 1811' were found engraved into the copper.

163. Report, op. cit., p. 4.

164. Ibid., p. 5.

The eccentricity was not then found to be of dangerous proportions, though a constant vigilance, including an annual rechecking, was recommended.

It might have been assumed in A.D. 1940 that the architect taking into account the effect of the wind pressure which was apprehended most on the minarets, deliberately inclined them, each according to its directional position. But the data collected after about twenty-five years disproved the hypothesis, as the inclination has increased as follows:[165]

		Displacement	Direction of inclination (from the assumed north)	Height from the base
South-east minaret	—	5.0" (13 cms.)	146°	132.21 feet (about 40.23 metres)
North-east minaret	—	2.0" (5 cms.)	14°	131.30 feet (about 39.93 metres)
North-west minaret	—	1.5" (3.75 cms.)	257°	132.08 feet (about 40.22 metres)
South-west minaret	—	8.6" (21.50 cms.)	231°	132.14 feet (about 40.25 metres)

It can now easily be deduced that the displacement is of greater magnitude and consequently more dangerous in case of the minarets on the southern side; they are at the same time a little taller than those on the north; it has yet to be calculated when the resultant thrust would go off centre. It is however increasing at the rate of 0.5" (1.25 cms.) in the S.E. and 0.1" (0.25 cms.) per twenty-five years in the remaining three minarets. The S.W. minaret is in the most dangerous condition.

This increasing inclination of the minarets is alarming. The slope towards the northern side adds to the apprehension. The cracks have developed to a dangerous magnitude in the second storey, mainly on the apex of the vaults and ceilings, in the underground chambers and also in and around the base of the massive piers near the marble plinth of the main tomb. Here the huge marble slabs have sometimes been crushed to pieces. All this proves that something has gone seriously wrong with the foundations. It is not due to some leakage of water into the foundations; nor is it due to the shock of some underground movement. In both these cases the cracks would have travelled continuously from one storey to another; they would not have been localised abundantly in the subterranean vaults and next in the second storey. Moreover, the plinth and the minarets would not have inclined, had the damage been of any such nature. It is, it appears, on account of the sinking of the whole massive edifice towards the riverside. A structure which stands at the end of a stylobate just on the edge of water has a natural tendency to move towards the more open side, the higher edge always acting as a strong buttress, thrusting it in the opposite direction. There is no doubt that the builders of the Taj were conscious of this danger. That is why they bonded the whole mass together, with the very best materials, into a compact body. It however began with the displacement of soil beneath the foundations on the riverside. It is the whole mass, and not a part of it, that is very gradually sinking. This is what can justifiably be concluded from the available data.

Will this grand majestic memorial be left to its fate to crumble down and vanish into the cruel waters of the Jamuna?

Will deceitful Nature be allowed to play so ruthlessly with the Taj?

Will the architect of the Taj Mahal have to pay such a high price for selecting the site so near the river? Posterity will never forgive us if we fail to preserve it and to pass it down to coming generations as it has been passed down to us!

165. Survey of India (Dehra Dun) Letter No. T/30544/1115-Tech dated 7th September 1967, in reply to my enquiries in this connection.

A TRIBUTE TO ITS ART

Gurudeva Rabindranath Tagore earnestly desired: 'Only let this one tear-drop, this Taj Mahal glisten spotlessly bright on the cheek of Time for ever and ever.'[166] Tagore analysed the personal character of the Taj better than anybody else could do—'O King, you sought to charm Time with the magic of beauty and weave a garland that would bind formless death with deathless form!—despite all this, the courier of your love, untarnished by time, unwearied, unmoved by the rise and fall of empires, unconcerned with the ebb and flow of life and death, carries the ageless message of your love from age to age! .... The mausoleum stands still and unmoving in its place, here on the dusty earth, it keeps death tenderly covered in the shroud of memory! ....'

The Taj is not merely a potential foreign exchange earner, it is something more than that. It is an important part of our cultural heritage. It is a wonderful work of art, more than of architecture. 'It is the most graceful and the most impressive of the sepulchres of the world,' as Fergusson designated it. Major Archer had a similar opinion, '... most gorgeous and magnificent mausoleum under the heavens. Those who have admired all that remains of Grecian or Roman art have not seen anything by which a comparison could be instituted or a resemblance conveyed. Composed of white marble and inlaid with various coloured stones highly polished it has the freshness of yesterday's erection.'

It is a 'dream in marble' as W. H. Russell called it. He wrote, 'It is a thought, an idea—a conception of tenderness—a sigh of eternal devotion and heroic love....well was it said to me by one who loves not India or her races—"If the people of this land really built the Taj, the sooner we English leave the country the better. We have no business to live here and claim to be their masters."' Can there be a better tribute to the Taj, and the heritage it enshrines, than this?

Percy Brown defined it as a 'materialised vision of loveliness' which marks the perfect moment in the evolution of Mughal architecture. It is the most beautiful creation that could be conceived by human hand. 'So pure, so gloriously perfect did it appear that I almost feared to approach it lest the charm should be broken,' Bayard Taylor commented feelingly.

The Taj is a poem in marble. It is a poem full of grief which Shah Jehan personified in stone. That is what Tagore observed. Sir Edwin Arnold similarly composed:

'Not Architecture! as all others are
But the proud passion of an Emperor's love
Wrought into living stone, which gleams and soars
With body of beauty, shining soul and thought as when some face
Divinely fair unveils before our eyes
Some woman beautiful unspeakably—
And the blood quickens and the spirit leaps
And the will to be worship bends the half yielded knees
While breath forgets to breathe.
So is the Taj!'

THE 'FEMININITY' OF THE TAJ

The beauty of the Taj is unmistakably feminine. E. B. Havell commented that the Taj is 'an apotheosis of Indian womanhood.... If they [the builders of the Taj] could not carve her statue they [erected a] unique architectonic symbol of her loveliness. The Taj grew up under their hands a living thing with all the aesthetic attributes of perfect womanhood; [it is] more subtle, romantic and tender in its beauty than any other building of its kind.... [the marble surface has been] sometimes deli-

166. *'Ek bindu noyan neer jal kaler kapol-tale subhra samujjal e-Taj Mahal.'*

cately carved in low relief, sometimes inlaid with all manner of precious stones as if to stimulate a matchless loom-embroidered sari.'

On another occasion he explained the point emphatically: 'The Mughal artists being prevented by the precepts of Islam from attempting sculpture succeeded in investing their great architectural monuments with an extraordinary personal character. There is a wonderful personality in the dignity and greatness of Akbar's tomb; we see the scholar and the polished courtier in Itmad-ud-Daulah's. But the Taj carries this idea of personality further than had been attempted in any of the Mughal monuments; it represents in art the highest development towards individualism...what were the thoughts of the designers and of Shah Jehan himself when they resolved to raise a monument of eternal love to crown the Palace—Taj Mahal? Surely not only of a mausoleum—a sepulchre fashioned after ordinary architectural canons, but of an architectonic ideal, symbolical of her womanly grace and beauty. Those critics who have objected to the effeminacy of its architecture unconsciously pay the highest tribute to the genius of the builders. The Taj was meant to be feminine. The whole conception and every line and detail of it express the intention of the designers. It is Mumtaz Mahal herself radiant in her youthful beauty who still lingers on the banks of the shining Jamuna at early morn, in the glowing midday sun or in the silver moonlight. Or rather we should say, it conveys a most abstract thought; it is India's noble tribute to the grace of Indian womanhood.'

Percy Brown thought along identical terms: 'It is from such positions that the character of feminity with which this monument has been accredited becomes apparent, a quality presumed to be intentional as a tribute to the sex of the royal personage it enshrines. This impression has been evoked by several particulars among which are the plastic delicacy and soft moulding of its contours, the superfine treatment of its decoration and the chaste texture and subtle colouring of its material which combined with the gracious and poetical nature of the building as a whole all tend to imply a humanity which can only be feminine.'

The Taj Mahal is as much part of Indian art and architecture as are the Sarnath Pillar and Capital, the Stupa of Sanchi, the temples of Deogarh, the Ajanta Caves, the temples of Khajuraho, the Man Mandir at Gwalior, the Gobind Deva Temple of Vrindaban, and other great monuments scattered throughout India. The unbroken art traditions of the country produced the temples of Khajuraho in one art epoch, the tomb of Sher Shah in another, and the Taj Mahal, in still an other.

That Shah Jehan accorded a patronage to these traditions, that he financed the projects and employed a certain amount of initiative is something which can hardly be denied. The Mughals, with their liberal outlook, and more than that, with a proverbial love of the beautiful, revitalised the art traditions of the country; they introduced a new vigour into them. They gave the Indian art a new direction which ultimately brought it to such a magnificent and splended apex as to evoke the wonder and appreciation of all ages.

The Taj is an important part of our cultural heritage. It is not a monument of Islam based on Byzantine, Arabic or Persian aesthetic norms; it is produced in accordance with our ancient *Vastu*-canons. Except for the newness of combinations there is nothing new at the Taj Mahal. It is the representation—the reorientation—of well tried architectural values which has brought about its incarnation.

Appendices

A. The Mughal Tomb and Buddhist Stupa

IT IS A curious parallel of history that the Mughal tomb developed on the same lines on which the Buddhist stupa had grown. Though the evolution of the two essentially different constructions cannot be interconnected, the two can adequately be compared as having many points of similarity.

(1) The stupa was originally a funerary structure and later housed the relics of the Buddha or important Buddhist monks. The Mughal tomb was also funereal and contained the remains of kings and nobles.

(2) The stupa was a religious symbol and was in worship before the image came into vogue. Its religious sanctity remained undiminished even after that. The tomb often has a mosque attached to it which gave it an equally religious character.

(3) The stupa is generally spherical and with its receding tiers it has a pyramidal effect. The tomb also has a spherical dome and with its receding storeys has an identical pyramidal effect. Both have a soaring height though the symbolism of the former has not been kept in view in the latter. The stupa has crowning elements in which culminated the whole being of the hemisphere. The dome also has the crowning features, which are essentially identical.

(4) The stupa has a railing round it with gateways at the four cardinal points. The Mughal tomb also has a walled enclosure and four gateways on the four sides, the main gateway being more monumental than the others. This gateway is often a grand two-storeyed structure, complete in itself and generally having a central octagonal hall and subsidiary chambers suitably disposed around it. This was a great innovation which impressively introduced the building to the visitor.

(5) The stupa has a circumambulatory (*pradakshina-path*). The tomb also has a rotating verandah or an arrangement of passages and rooms round the central mortuary hall.

(6) The stupa provided surfaces for the display of art, chiefly sculpturesque decor. The Mughal tomb was also profusely ornamented and had all forms of decoration on the exterior as well as in the interior. The decorator worked side by side with the architect and, as in the former case, played a significantly important part in the planning of the Mughal tomb, much of the grace and charm of which is attributable to his genius. The white marble has been used here to relieve the monotony of the red sandstone surfaces. The blending of the two types of stones, in inlay as well as in mosaic, successfully presented a varied and pleasant effect. Islamic forms of mural painting and stucco designs have also been employed.

B. An Introduction to the Inscriptions of the Taj Mahal

THE INSCRIPTIONS at the Taj Mahal have been very judiciously selected and artistically inscribed over the main gateway, in the Mosque and the Tomb proper, in panels around the arched portals, alcoves and the niches. They are chiefly verses from the Quran. South Gateway which is the main entrance has, along its front and sides, the whole chapter 'Walfazr' (The Daybreak) (Sura-89, containing 30 verses),[1] chapter 'Wad-duha' (The Glorious Morning Light) (Sura-93, containing 11 verses),[2] chapter 'Wat-tin' (The Fig) (Sura-95, containing 8 verses),[3] and chapter 'Alam-nashrah' (Have We Not Opened) (Sura-94, containing 8 verses).[4]

Fifteen verses of Sura-91, entitled 'Wash-Shams' (The Sun)[5] and 4 of Sura-112 entitled 'Sura Ikhlas' (The Declaration of God's Unity)[6] have been inscribed inside the Mosque of the Taj Mahal. Particularly noticeable are the verses from Sura-112 which speak that God is one and the only One; He is Eternal and Absolute. He is the Supreme Reality. All are dependent upon Him. He is unique; there is nobody like him and he resembles none. These verses profess the Unity of Being. That such highly philosophical verses have been inscribed in this monument is a point of special significance.

The portals (*iwans*) of the main tomb are adorned with the text of Sura-36 entitled 'Ya-Sin' (containing 83 verses).[7] Arched niches inside the portals have verses from Sura-81, entitled 'Izash-Shamso Kuvvirat' (The Folding Up),[8] Sura-82 entitled 'Izas-Samaun Fatarat' (The Cleaving in Sunder),[9] Sura-84 entitled 'Iz-as-Samaun Shaqqat' (The Rending in Sunder)[10] and Sura-98 entitled 'Lam-Yakonil Lazina Kafaroo' (The Evidence).[11]

Verses from Sura-67 entitled 'Mulk' (Dominion),[12] Sura-48 entitled 'Fath' (Victory),[13] Sura-77 entitled 'Mursalat' (Those Sent Forth)[14] and Sura-39 entitled 'Zumar' (The Crowds)[15] have also been inscribed in the mortuary hall around the frieze and also around the arched niches. Particularly remarkable are the verses from chapter 67, e.g., *tabarakal lazi be yadihil mulko*

1. Cf. George Sale, *The Koran*, pp. 488-90; Abdullah Yusufali, *The Holy Quran*, Vol. III (Lahore, 1938), pp. 1730-35.
2. Sale, p. 492; Abdullah, pp. 1750-53.
3. Sale, p. 493; Abdullah, pp. 1757-59.
4. Sale, p. 493; Abdullah, pp. 1754-56.
5. Sale, p. 491; Abdullah, pp. 1741-44.
6. Sale, p. 504; Abdullah, pp. 1805-6.
7. Sale, pp. 361-65; Abdullah, pp. 1168-88.
8. Sale, pp. 480-81; Abdullah, pp. 1692-97.
9. Sale, p. 482; Abdullah, pp. 1698-1701.
10. Sale, p. 484; Abdullah, pp. 1708-12.
11. Sale, pp. 495-96; Abdullah, pp. 1767-69.
12. Sale, pp. 458-59; Abdullah, pp. 1575-83.
13. Sale, pp. 413-17; Abdullah, pp. 1389-1401.
14. Sale, pp. 476-77; Abdullah, pp. 1662-70.
15. Sale, pp. 377-83; Abdullah, pp. 1235-39.

wa huwa ala kulli sharin Qadir (Blessed be He in whose hand is the Kingdom, for He is Almighty). We have the same chapter inscribed in the vestibule of Akbar's Tomb at Sikandara and, as seems probable, Shah Jehan respectfully followed his august grandfather's rare choice of these Quranic verses in their selection for his own mortuary hall.

It may be noted that in Akbar's tomb at Sikandara, the inscriptions are mostly in Persian, being verses from Persian poetry. Some are in praise of Akbar; others have been composed in accordance with the Imperialistic policy of the Emperor or depict his philosophical views towards life and religion. The Quranic verses are there only in the vestibule leading to the mortuary chamber. These are thirty verses of chapter 67, last three verses of chapter 37 and verse 56 of chapter 33, numbering thirty-four in all. At the Taj Mahal, on the other hand, the inscriptions are mostly Quranic verses. Persian inscriptions are there, artistically inlaid in between beautiful stylized floral patterns on the tombstones and the cenotaphs in the lower and the upper hall respectively. They are epitaphs; two of the upper hall may be quoted:

(1) Epitaph on the south side of Shah Jehan's cenotaph (Upper Hall)—*Marqad mutahar aali Hazrat Firdaus Ashiyani Sahib-qiran saani Shah Jehan Badshah taab surah sanh 1076 Hijri.*

(The sacred sepulchre of His Most Exalted Majesty, dweller of Paradise, the Second Lord of Constellation, the King Shah Jehan, may his mausoleum ever flourish, 1076 Hijri A.D. 1666).

(2) Epitaph on the south side of Mumtaz's cenotaph (Upper Hall)—*Marqad munavvar Arjumand Banu Begum mukhatib bah Mumtaz Mahal taufiyat fee sanh 1040 Hijri*

(Here lies Arjumand Bano Begum called Mumtaz Mahal who died in 1040 Hijri A.D. 1630).

The tombstones and the cenotaphs also bear a few verses from chapters 41, 40, 83, 2, 59, 39, 3 and 23. They have very carefully been selected for the place and depict the realities of life and death in one way or the other. There are such philosophical references as the one inscribed on the cenotaph of Mumtaz Mahal above the epitaph No. 2 (quoted above), e.g.,

Al muqrebun innalazee qaalu rabbanallah

(Those who say Allah is our God, shall approach near unto the Divine presence).

C. A List of Some Artists with Their Native Places, Specialization and Monthly Salary, Employed at the Taj Mahal

Muhammad Hanif	Agra	Supervisor of Masons	Rs. 1000/-
Sattar Khan	Turkey	Calligrapher	1000/-
Amanat Khan	Shiraz	Calligrapher	1000/-
Kadir Zaman Khan	Arabia	Calligrapher	800/-
Chiranjilal	Delhi	Sculptor & Mosaicist	800/-
Baldeodas	Multan	Sculptor	690/-
Abdul Ghaffar	Multan	Calligrapher	600/-
Wahab Khan	Persia	Calligrapher	600/-
Ismail Afandi	Turkey	Dome-builder	500/-
Muhammad Khan	Baghdad	Calligrapher	500/-
Roushan Khan	Syria	Calligrapher	400/-

NOTE: The name of Muhammad Isa Afandi has sometimes been suggested as the chief architect of the Taj Mahal. The contemporary records do not make any such mention and the idea seems to have been a later innovation. As a matter of fact, the Indian artist is anonymous. We do not meet with the names of the painters, sculptors and architects of Ajanta or Ellora. The master-artists of the Khajuraho sculptures are similarly unknown to us. Then, we do not know the names of the builders of the tomb of Akbar or of Itmad-ud-Daulah at Agra. Islamic tradition, on the other hand, is more in favour of recording history with the necessary details. The Islamic artist was particular in leaving a record of his name and place with the date. For example, the calligrapher at the tomb of Akbar did not forget to inscribe the words—'Abdul Haqq, son of Qasim Shirazi in 1021 A.H.' Amanat Khan Shirazi, likewise, inscribed his name on the main gateway of the Taj Mahal. We can, therefore, safely surmise that if the names of the chief builders of the Taj Mahal are not known to us they would surely be indigenous artists who, in faithful adherence to their tradition, did not consider it necessary to leave a record of their mortal being and, true to their artistic conviction, preferred to remain anonymous.

However, we find that the Muslim chroniclers have maintained a record of some Hindu sculptors and inlayers who were employed at the Taj. It is not known why they have, then, failed to record the names of the chief builders which, unless they were specifically barred, they could have done! The two views are yet to be reconciled.

D. A List of some Inlayers (Pachchikars) with Places of Their Residence and Monthly Salary, Employed at the Taj Mahal*

Munnoolal	Lahore	Rs. 680/-	Manohardas	Multan	Rs. 295/-
Jamnadas	Delhi	680/-	Madhoram	Lahore	273/-
Basharatali	Delhi	632/-	Chintamani	Multan	252/-
Bhagwandas	Multan	630/-	Banaidhar	Multan	244/-
Chhoteial	Multan	600/-	Hiraman	Multan	234/-
Jhumarlal	Multan	600/-	Manoharsingh	Lahore	200/-
Sheojilal	Multan	342/-	Mohanlal	Kannauj	200/-

* Syed Hasan (ms. entitled 'Taj-Mahal' in possession of Agra College, Agra, f. 13) and Mughal Beg (ms. 'Taj-Mahal' in possession of the Department of Archaeology, Northern Zone, Agra, f. 32-33) unanimously maintain this list; Moinuddin—*The Taj and its Environments* (Agra, 1924), pp. 117-18.

E. A List of Rare, Semi-precious and Precious Stones Used for Inlay in the Taj Mahal

1 Abri (Bloodstone)
2 Ajuba (Wonderstone)
3 Aqiq (Cornelian)
4 Billor (Crystal)
5 Dhana-i-farang (Malachite)
6 Firoza (Turquoise)
7 Ghori*
8 Hira (Diamond)
9 Khattu (Agate)
10 Lajward (Lapis Lazuli)
11 Maqnatis (Loadstone)
12 Moonga (Coral)
13 Moti (Pearl)
14 Neelam (Sapphire)
15 Pai-Zahar (?)
16 Pitunia (Jade)
17 Pukhraj (Topaz)
18 Reg (Glasstone)
19 Sankh (Conch-shell)
20 Seep (Mother-of-pearl)
21 Sulaimani (Onyx)
22 Surkh (Redstone)
23 Tamra (Garnet)
24 Tilai (Goldenstone)
25 Yamani (a Cornelian)
26 Yaqut (Ruby)
27 Yashab (Jasper)
28 Zamurrad (Emerald)

* A kind of porcelain which breaks the moment poison is put into it.

NOTE: These stones have different values and different aesthetic impressions according to the transparency of light. Of greater importance than these two aspects was their relationship with the signs of the Zodiac. The Mughals firmly believed that the precious and semi-precious stones have different effects on the fortunes of different persons and places; they are accordingly auspicious or inauspicious. This has precisely been calculated and strictly adhered to in the ornamentation of the Taj Mahal; hence the predominance of one or the other stone on a particular feature of its architecture.

It has to be observed, however, that this aspect of Mughal art, like the study of the mason-marks, has yet to be taken in hand and thoroughly investigated with a view to get an insight into the beliefs and disbeliefs of the medieval people; it would be as interesting as historically useful to discriminate between science and superstition.

F. Save the Taj : It Sinks

ATTENTION of the Government was drawn to the gradual sinking of the Taj Mahal into the Jamuna in my article entitled 'The Taj in Danger' published in the *Sunday Standard* of April 7, 1968. Though the concerned authorities promptly came to Agra, their approach to the problem was hardly constructive. It is a matter more to be surprised of, than to be regretted, that, while many inquiries were posed, no attempt was made to ascertain the accuracy of the data I have given in my article, or, if it was correct, to examine the logic of the interpretation which had been derived therefrom. It was declared, subsequently, in the *Hindustan Times* of May 27, 1968 that the cracks are age-old and no new one has developed and that 'There is no reason for any alarm.'

Obviously, undue credence was attached to the glass tell-tales without examining the ever enlarging cracks and without going into the details of these tell-tales which are hardly competent to tell any tale after Independence. The hollowness of the much professed vigilance of the concerned authorities was recently exposed when a turret of the Jami Masjid of Agra collapsed and fell down in the busy bazar below, creating great damage and destruction. Though it was in need of repairs for years together, no attention whatsoever had been paid to it! 'The reason for alarm,' viz., the growth of vegetation chiefly peepal and accumulation of rain-water, though it was constantly there, had never been admitted!

There is no doubt that the cracks in the Taj were first noticed in 1652; I had myself given a brief history of those cracks and their repairs upto 1940 in my article referred to above. However, the cracks are only a minor result of the sub-soil displacement and the damage to which the structure is consequently subjected. Of greater importance are the two aspects: the inclination of the marble plinth towards the river-side by more than an inch and the inclination of the minarets, one of which has gone as much as 8' 6" (21.50 cms.) out of plumb! Unfortunately no allusion to these, whatsoever, has been made in the above referred declaration of the authorities. I cannot help feeling that the colossal amount of responsibility which is involved in this vitally important problem hardly justifies the brushing aside of the issue so lightly. Can we hazard to stand aside, looking smilingly into another direction and wait till the Taj crumbles down like the turret of the Jami Masjid at Agra?

That the monument has been subjected to alarming damage, e.g., the cracks, the inclination of the plinth and an undeniably dangerous inclination of the minarets, proves that something has gone seriously and extraordinarily wrong with the foundations. It is not due to some leakage of water into the foundations; nor is it due to shock of some

underground movement. In both these cases the cracks would have travelled continuously from one storey to another; they would not have been localised abundantly in the subterranean vaults and next in the second storey. Moreover, the plinth and the minarets would not have inclined, had the damage been of any such nature. As it seems, it is on account of the sinking of the whole massive edifice towards the riverside. It may be reiterated that a structure which stands at the end of a stylobate just on the edge of water has a natural tendency to move towards the opener side, the higher edge always acting as a strong buttress, thrusting it in the opposite direction. There is no doubt that the architects of the Taj were conscious of this danger. That is why they bonded the whole mass together with the very best material into a compact body. It, however, began with the displacement of the soil beneath the foundations on the riverside. It is the whole mass—and not a part of it—that is very gradually sinking.

That is what can justifiably be concluded from the available data. It is inconceivable that the builders of the Taj deliberately gave an inclination in the horizontal axis of the marble plinth. Each of the four sides of the marble plinth around the mausoleum has its own gargoyles for the discharge of rainwater; thus there is slope respectively on each side and not on the riverside alone. This disproves the theory that the architect inclined the plinth deliberately. That the inclination is on the horizontal axis of the plinth is a sufficient proof that it is inclining towards the river as a whole.

The inclination of the minarets may be on account of the same reason. The displacement of the central axis along its elevation in each case however differs. The nature of this difference has yet to be ascertained. The inclination of the minarets is increasing in each case as shown in Table below.

The glass tell-tales may not tell any tale, but the story which is revealed by the increasing inclination of the minarets can scarcely be ignored. It proves beyond doubt that the destruction, for whatever reason it has set in, is not static but is in process. It might have brought out other effects on the monument which have yet to be surveyed and scrutinized. For example, we have still to ascertain if the central marble structure has also gone out of plumb, and, if so, in what particular direction. We have to examine if the inclination of the plinth has also increased. Last of all, we may open out the sealed passages beneath the mausoleum and get access to a traditionally claimed crypt containing the third set of real graves; we may then ascertain if they were closed down in 1652 by Aurangzib to give additional strength to the base which supported such a huge load above, or with some other secret purpose in view. The floor of the closed-down passages and chambers conceals a substantial clue. This has to be opened and examined. There is much to be done in the interest of this grand mausoleum. A mere assertion that *There is no reason for any alarm* will only lead us to play an ostrich who after getting tired of the pursuing beast hides its head into the sand and assures itself—'Now it is all right.' Only a realistic approach to the problem will help us to save the monument from the impending catastrophe.

Minaret	Inclination in 1940	Inclination in 1965	Increase in 25 years
SE	4.5° (11.48 cms.)	5.0° (12.70 cms.)	0.5° (1.22 cms.)
NE	1.9° (4.82 cms.)	2.0° (5.08 cms.)	0.1° (0.26 cms.)
NW	1.4° (3.68 cms.)	1.5° (3.81 cms.)	0.1° (,,)
SW	8.5° (21.59 cms.)	8.6° (21.65 cms.)	0.1° (,,)

Glossary

ABUTMENT .. That portion of a pier or wall which sustains an arch; solid masonry which resists the lateral pressure of an arch.

AISLES .. Wings; portions of a mosque on the sides of the nave; lateral divisions parallel with the nave; the division between nave and aisles is usually by piers and columns often carrying arches.

ALCOVE .. A vaulted recess; a sunk arch or niche with adequate depth generally having a semi-soffit.

AMALAKA .. Crown of the *sikhara* of Nagara temple; it has cogged rim, with ribs of a ring shape; it is crowned by the *kalasa*-finial.

ANIMATION .. Depiction of living beings: birds, beasts or human beings.

APSE .. The circular or multangular termination of a sanctuary usually semi-circular in plan but occasionally polygonal.

ARABESQUE .. Surface decoration, light and fanciful in character, much used by Arabian artists in elaborate continuations and repetitions of curved lines; applied also to the combinations of flowing lines interwoven with delicate conventional foliage.

ARCADE .. A range of arches supported on piers or columns (attached to or detached from the wall) carrying a roof, wall, entablature or other superstructure.

ARCH .. An arc of a curve; a structure of wedge-shaped blocks over an opening so disposed as to hold together when supported only from the sides, the load resting vertically; a self-supporting structure composed of bricks or of stone blocks (voussoirs) and capable of carrying a superimposed load over an opening; the voussoirs are usually wedge-shaped to prevent slipping but in rough work are occasionally rectangular, the joints between them increasing in width from the underside upwards; the principal types of the arch are (a) semi-circular, (b) segmental, (c) stilted, (d) Tudor, (e) horse-shoe, (f) lancet (pointed), (g) equilateral (pointed), (h) three-centred, (i) four-centred (j) elliptical, (k) cusped (engrailed), (l) ogee. Principal parts of an arch are abutment, archivolt, crown, rise, extrados, impost, intrados, keystone, span, spandrel, spring, springer and voussoirs. Corbelled arch though it has an arcuate shape is built on trabeate or horizontal system and has no voussoirs. The ancient Hindus largely used this arch.

ARCHITECTONIC .. A term implying that a building shows a knowledge of architectural principles on the part of its designer.

ARCHITECTURE .. (Latin *'architecture'*, Greek *'architekton'*); literally chief craftsman or master-builder. The science as well as an art of designing buildings; architecture must fulfil three conditions: (i) a building must be conveniently planned for its purpose, (ii) be soundly built of good material and (iii) must give pleasure to the eye of a discriminating beholder (its aesthetic aspect is probably the most important).

ARCHITRAVE .. The beam or lowest division of the entablature which extends from column to column; a moulded frame round a door or window; the lowest member of the entablature resting directly upon the capitals of the supporting columns; a moulding surrounding or framing a doorway or a window opening inside or outside a building.

ARCHIVOLT .. The mouldings on the face of an arch and following its contours; a moulding curving round an arch.

ARCUATED .. A style of architecture in which the structure is supported on arches and vaults; in contrast to 'trabeated' architecture where vertical posts and horizontal beams are used structurally throughout; this style calls for the use of radiating arches and the load thus rests vertically.

ASHLAR .. Masonry or squared stones in regular courses in contradistinction to rubble work.

AST-SUTRAKAM .. Eight traditional tools of construction of the Hindus, including eye, thread (sutra), plumb, triangular scale, etc. These tools are extremely simple, yet ensure a most scientific construction.

AZAN .. (Arabic) the call to prayer for Muhammedans.

BALCONY .. A platform projecting from the face of a building outside supported on brackets, generally protected by a railing and sometimes covered by a roof.

BALUSTER .. A pillar or column supporting a handrail or coping, a series of such being called a balustrade; row of vertical members supporting a handrail or coping (forming an external parapet) constitutes a balustrade; the intermediary space is usually filled with *jalies*.

BAOLI .. Step-well; a traditional water-structure of Gujarat. Also called *Wav*.

BASE .. The lower portion of any structure or architectural feature.

BASEMENT .. The lowest storey of a building; also applied to an underground storey.

BASTION .. One of the series of projections from the main curtain wall of a fortress placed at intervals in such a manner as to enable the garrison to keep off the besiegers attacking the intervening stretches of wall; bastions are pentagonal, semicircular or triangular.

BATTER .. A determined slope in the exterior wall; a term applied to a wall with an inclined face; the purpose is either to increase the strength of the base as in retaining walls or to add to the defensive strength of the wall.

BATTLEMENT .. A parapet having a series of indentations or embrasures, between which are raised portions known as merlons; archers or musketeers could shoot through the embrasures between the protecting merlons.

BAYS .. Compartments of the sanctuary or of cloisters each with four pillars or piers and each with a roof of its own.

BEAM .. Any horizontal structural member of any material resting upon two or more supports and subject to a transverse load.

BLOCKING COURSE .. A course of solid masonry built upon the top of a projecting cornice and serving to neutralize any tendency of the cornice to overturn the wall.

BOSS .. A projecting ornament at the intersection of the ribs of ceilings whether vaulted or flat, often delicately carved with foliage.

BRACKET .. A projecting member to support a weight, generally a beam or *chhajja*; it is triangular or serpentine and is richly ornamented with scrolls or volutes.

BULBOUS .. A dome rising like a bulb, a high dome supported on a tall cylindrical drum or base.

BUTTRESS .. (To bear against); a mass of masonry built against a wall to resist the pressure of an arch or vault.

CALLIGRAPHY .. (*Ilmul-Khatt*), the art of writing or inscribing Arabic script; used originally in paintings, then for architectural ornamentation.

CAPITAL .. (Latin '*caput*' = head); the crowning feature of a column; the moulded or carved top of a column serving to concentrate the superincumbent load on to the shaft of a column and often treated with great richness of ornament; brackets spring from the capital.

CARVO-INTAGLIO .. Incised or low relief; incised or low or deep undercutting; engraving; the incised technique has also been applied to painting and stucco by the Mughals.

CARVO-RELIEVO .. High relief.

CAUSEWAYS .. Raised stone-paved paths connecting the main building with subsidiary structures, often with water channels.

CEILING .. The covering of a room which may be flat, segmental, semicircular, groined or vaulted.

CENOTAPH .. (Greek, an empty tomb); a tombstone; a sepulchral monument to a person buried elsewhere; a replica of the real grave.

CENTERING .. A temporary support erected to facilitate the construction of a brick or stone arch or dome and removed when the mortar has set.

CERAMICS .. Perfectly baked and polished, or otherwise having finished surfaces, tiles or other articles of clay.

CHAMFER .. (French '*chanfrein*' = channel); a diagonal cutting off of an arris formed by two surfaces meeting at an angle; an angle or edge cut off diagonally.

CHAHAR-TAQ .. A domed structure supported on four arches on the four sides.

CHAR-BAGH .. Four-quartered garden having in the centre a tank or a structure.

CHEVRON .. A regular zig-zag pattern of straight lines generally disposed horizontally on pilasters or turrets in Mughal buildings.

CHHAJJA .. A projecting stone feature above the arches to protect from rain or sun, generally slanting and broad; it is a characteristic feature of Mughal architecture; roughly eave or dripstone.

CHHATRI .. A kiosk or a pavilion with four, six or eight pillars with a cupola or pyramidal roof supported on brackets and lintels; it was used by the Mughals for effect on the superstructure; A Rajput funereal structure in the post-Mughal period.

CINQUEFOIL .. (Five Leaves); in tracery an arrangement of five foils or openings terminating in cusps.

CLOISTERS .. *Dalans;* three-sided verandah in a Mughal mosque; covered walk or arcade usually around the sides of a quadrangle.

COFFERS .. Sunk panels formed in ceilings, vaults and domes; sometime they are given in the walls also.

COLONNADE .. A range of columns.

COLUMN .. (Latin '*columna*' = a post); a vertical support generally consisting of base, circular shaft and spreading capital.

CONGREGATION .. Assembly of the faithful for prayers.

CONVENTIONAL .. A floral design which adopts a set form after constant use and looses natural bends and twists; adapted and highly sophisticated form of a floral design.

COPING .. The protective capping or covering of brick or stone on the top of a wall; it usually projects slightly over the wall face and has a throating or groove to prevent rain water from running down the wall face.

CORBEL .. A beak like projection; a block of stone often elaborately carved or moulded projecting from a wall, supporting the beams of a roof, floor, vault or other feature; it is used triangularly at the angles to span the space.

CORBELLING .. The system of spanning a space where each upper course, which superimposes the lower one successively regularly projects forward, ultimately reducing the span to be coverable by a single slab or block of stone.

CORNICE .. The crowning or upper portion of the entablature; also used as the term for any crowning projection.

CORRIDOR .. A wide passage in a building connecting two rooms or two sets of rooms.

CRESTING .. (Summit); a light repeated ornament incised or perforated carried along the top of a wall or roof; the crowning ornamental feature of the parapet.

CROWN .. The highest point of a semi-circular arch or vault, corresponding to the 'apex' of a pointed arch.

CRYPT .. (Greek '*kryptos*' = hidden); a space entirely or partly under a building; *tahkhana*; the underground mortuary chamber.

CUES .. Environmental factors contributory to the aesthetics of a building.

CUPOLA .. (Latin '*cupa*' = cup); a spherical roof placed like an inverted cup over a circular, square or multangular apartment; it is generally crowned by lotus-petals and a finial in Mughal architecture.

CURVED ROOF .. A roof which is curved or bent in the middle along with the curved cornice and the curved parapet; it imitates the bamboo curved roof of a thatched hut.

CUSP .. (Latin '*cuspis*' = a point); the point formed by the intersection of the foils; cusps divide the arch into a series of foils and are ornamental.

CYMA .. A moulding with an outline of two contrary curves.

DADO .. Lower portions of wall when decorated separately.

DESIGN .. The architect's graphical solution of a project or programme—economically, structurally and aesthetically.

DIAPER .. Any small pattern repeated continuously over the wall surface; it consists of rows of flowers each framed in a square.

DIWAN-I-AM .. Mughal Hall of Public Audience; ceremonial place for the general assembly.

DIWAN-I-KHAS .. Mughal Hall of Private Audience; place for conducting important state business of a confidential nature; Council House where only the important grandees of the Empire were admitted.

DOME .. (Italian '*duomo*' = a cathedral, Latin '*domus*' = a house); a convex roof, of approximately hemispherical form, erected over a square, octagonal or circular space in a building; cupola is an almost synonymous term; for ideal visual effect a dome needs to be steeper than a hemisphere externally, hence famous domes are of double construction.

DOUBLE-DOME .. A dome which is hollow inside; it has two layers, one which is in the interior and roofs the room below, the other or the external surface proclaims the monument from afar.

DRIPSTONE .. The projecting moulding over the heads of doorways, windows and archways to throw off rain water; the Mughals used extremely slanting and broad features for this purpose which can better be called *chhajja*.

DRUM .. The cylindrical lower part of a dome; base or the neck of the dome; it may also be square or polygonal.

EAVES .. The lower part of a roof projecting beyond the face of the wall.

ENCAUSTIC PAINTING .. A painting done with hot iron tools along with wax, resin or lac as its base.

ENCAUSTIC TILES .. Tiles inlaid with decorative patterns in differently coloured clays, afterwards burnt in, used for architectural ornamentation.

ENGRAILED ARCH .. An arch with multifoils along its curves.

ENTABLATURE .. The upper part of an order of architecture (signifying a particular column) comprising architrave, frieze and cornice supported by a colonnade; arrangement of three horizontal members: architrave, frieze and cornice above the supporting columns.

ENTASIS .. A swelling or curving outwards along the outline of a column shaft, designed to counteract the optical illusion which gives a shaft bounded by straight lines the appearance of curving inwards.

EQUILATERAL ARCH .. A pointed arch with its radius equal to its span.

EXTRADOS .. The outer curve of an arch.

FACADE .. The face or frontal elevation of a building: one full front side facing the quadruple or any other open space.

FINIAL .. (Latin '*finis*' = end); the upper portion of a pinnacle or other architectural feature used for ornamentation; the crowning member of the dome or cupola.

FLORAL .. Vegetational pattern; a design with twigs, leaves, flowers and other similar motifs.

FLORALESQUE .. Resembling the vegetational pattern; adopted in a way so as to give a floral impression.

FLUTING .. The vertical channelling on the shaft of a column or pilaster.

FOIL .. (Latin '*folium*' = leaf); each of the arc openings in tracery separated by cusps; trefoil, quatrefoil, cinquefoil, etc., signify the number of foils.

FOLIATE .. Floral or having a resemblance with the floral design.

FOLIATION .. The provision of foils or curves in tracery or any other design.

FRESCO .. (Fresh); the term originally applied to painting on a wall while the plaster is wet but often now used for any wall painting not in oil colours.

FRESCO-BUONO .. A painting done on the wet plaster; it is thus incorporated into its structure.

FRESCO-SECCO .. A painting done on a plaster which has set; it is also called 'tempera'.

FRIEZE .. (Italian '*fregio*' = ornament); the middle division of the entablature; the front portion above the arches but below the parapet; if there is a *chhajja* the frieze can be below and above the *chhajja*.

FRINGE .. A continuous, garland-like series along the intrados of an arch either of spear-heads or of lotus-buds.

GARBHA-GRIHA .. Sanctum of the Hindu temple; innermost chamber of the Hindu temple for the reposition of the deity; it is generally closed, covered and dark.

GARGOYLE .. (Latin '*jurges*' = whirlpool); a projecting water-spout grotesquely carved to throw off water from the roof.

GEOMETRICAL DESIGN .. A pattern composed of geometrical elements, square, rectangle (4-sided), pentagon (5-sided), hexagon (6-sided), octagon (8-sided), decagon (10-sided), or other polygons, stars, etc., or motifs with curved lines.

GESSO .. Exquisite ornamentation in gypsum plaster preferably in low relief.

GHUSAL-KHANA .. The innermost private council chamber of the Mughals for strictly confidential business, wherein only the very privileged and selected few were admitted; it was closely guarded; synonymous with *Shah-Burj*.

GILDING .. A coat of gold or other brilliant colour over a piece of stucco or painting.

GLASS-MOSAIC .. Mosaic in which uniform convex glass pieces are used.

GLAZING .. Process in which the specially prepared colours (obtained from metallic oxides and fusible chemicals) are pasted first and then coated over with the glaze (made of sand and chemicals) and then the whole is fused; in this process the glaze retains its identity over the colour; it must be distinguished from 'enamelling' in which the colour and glaze are mixed together and the mixture is pasted on the tile and then the whole is fused.

GLAZED TILES .. Tiles (small uniform pieces of sand and silica) overlaid with chemicalised colours fused in excessive heat under a specialised process.

GLAZED-TILE MOSAIC .. A mosaic of glazed tiles; this mosaic is of two types: Tes-

selated-mosaic, in which each element of the design, flower or leaf is represented by a separate individual tile, cut up and assembled together; Square-tile-mosaic is different as in this type the whole pattern is divided into a certain number of relatively large squares of uniform size, each square, thus, containing a part of the whole design.

HAMMAM .. (Arabic '*hammam*', Persian '*hamam*' = to bathe or the bathing place); Mughals gave this name to their airconditioned private apartments which were used for secret councils or for convivial parties.

HAMMAM-I-SHAHI .. Technically Royal Bathroom of the Mughals; used generally for the private Council House of the Emperor, sometimes synonymous with *Ghusal-Khana*.

HASHIYAHS .. Borders, originally of the Mughal miniatures and then, by usage, of the dados of Mughal monuments.

HEMAKUTA .. The *Hindu* temple which has an octagonal sanctum, and four small rooms on the four sides all connected through a closed ambulatory, thus running all around the sanctum.

HEXAGONAL .. Six-sided.

HIJRAT .. The flight of Hazrat Muhammad from Mecca to Madina in A.D. 622, hence Hijri era begins after A.D. 622; it is a lunar system of calculation and differs from the Christian era, being one year shorter in every 30 years.

HUJRA .. Small room attached to the mosque for the residence of the *muezzin*.

IBADAT-KHANA .. House of worship; Prayer-hall; technically the place at Fatehpur Sikri where religious discussions were held under Akbar's orders.

IMPOST .. Latin '*imponere*' = to lay upon); the member usually formed of mouldings on which an arch rests.

INLAY .. Ornamentation composed of the specially cut pieces of rare or semi-precious stones laid in the sockets cut into a stone or marble slab according to the design; it should not be misunderstood for '*pietra dura*' which is the nomenclature of the Italian inlay similar in technique but different in material and motifs.

INTONACO .. Plaster or stucco background for the painting.

INTRADOS .. The inner curve of an arch or under side or soffit of an arch.

IWAN .. Central arched entrance originally with barrel-vaulted ceiling; in Mughal buildings; it is rectangular or semi-octagonal and has a semi-soffit or vaulted ceiling.

JALI .. Lattice; perforated screen.

JAMBS .. The sides of doors and windows; the portion outside window-frame is the 'reveal'.

KALASA .. The Hindu water-pot (*kumbha, purna-ghat*); integral part of the Mughal finial used to crown the domes and cupolas of the *chhatris*.

KEYSTONE .. The central stone of an arch generally ornamented; the voussoir on the crown or apex of an arch.

KIOSK .. (French '*kiosque*'); an open summer-house or pavilion usually having its roof supported by pillars; it is approximately synonymous with the Mughal *chhatri*.

KIRTIMUKHA .. Mouth of glory; *gavaksha* or the Sun-window of the Buddhist and Brahmanical architecture; a popular motif in Mughal architectual decoration used chiefly on the bases of pillars.

KUFIC .. Style of writing Arabic which according to Abul Fazl has one-sixth curvature and five-sixths straight lines; it is generally used in the inscriptions on monuments; generally devoid of points it is difficult to decipher.

LATTICE WINDOW .. A window divided into small panels arranged diagonally.

LATTICED WORK .. A jalied or perforated screen.

LINTEL .. The horizontal timber or stone that spans an opening and carries superincumbent walling.

LOTUS PETALS .. *'Padma-kosa'*; the uniformly set petals of a lotus flower generally used to crown the Mughal domes and cupolas; it supports the finial.

MACHICOLATION .. A projecting parapet with floor openings, through which molten lead, pitch, stones, etc., were dropped on an enemy below.

MAUSOLEUM .. (Greek *'mausoleion'*); a stately place of burial for a royal or other important personnage, so called after King Mausolus of Caria (4th century B.C.) whose magnificent tomb stood at Halicarnassus.

MEDALLIONS .. Rosettes or other circular motifs used generally in the spandrels of the arches.

MERLON .. One of the solid or tooth-like portions of a battlement between the embrasures (openings).

MIHRAB .. A sunk recess or a niche in the western wall of the sanctuary of the mosque indicating the *Qiblah*.

MINBAR .. A pulpit in the mosque generally with three steps; the *muezzin* occupies a position on the pulpit and leads the congregation.

MINARET .. (Arabic *'manara'*); originally indicated the tower where fire used to burn (from *nar* = fire); then a place where the call to prayer was given by the *muezzin* (hence *mazinah*); then a detached multi-storeyed tower sometimes functional through the spiral staircase but more ornamental in nature than merely utilitarian.

MONOLITH .. A single block of stone.

MONUMENT .. (Latin *'monere'* = to remind, hence a reminder or memorial); a building erected either over a sepulchre or elsewhere as a memorial.

MOSAIC .. Combination of small pieces of hard substances such as glass, stones and marbles generally multi-coloured to form a design; a form of surface decoration with the help of small pieces laid in plaster.

MOTIF .. The dominant or distinctive feature or element of a design.

MOULDINGS .. The contours given to projecting members; ornamental and continuous lines of grooving or projections worked respectively below or above a plain surface.

MULLIONS .. Vertical members (bars) dividing windows into different members of lights.

MULTIFOIL .. An arch having more than five cusps.

MURAL .. The ornamentation or any other feature distributed on the wall.

MUSALLAS .. Divisions of pavement of the sanctuary in a mosque, one for each faithful, having sufficient space to offer prayers in prescribed postures.

NASTALIQ .. (Naskh and Taliq); style of writing Persian whose characters consists entirely of round lines; its letters end in curves; Mughal inscriptions are generally in *Nastaliq*.

NAVE .. (Greek '*naos*' = dwelling, Latin '*navis*' = ship); central compartment of the sanctuary which contains the *mihrab* and the *minbar* and invariably roofed with a dome.

NICHE .. (Italian '*nicchio*' = shell); a recess in a wall hollowed like a shell for the reception of a statue or ornament; an ornamental recess in a wall usually with an arched top often but not invariably intended to contain a statue; Mughals used niches for surface decoration.

NOOK-SHAFT .. Small pilaster-like angles of a structure generally with a rope pattern in Mughal architecture.

OCTAGONAL .. Eight-sided.

OGEE .. A moulding or an arch made up of a convex and concave curve.

OGEE ARCH .. A pointed arch of double curvature, the lower curve being convex and the upper curve concave.

ORIEL .. A window corbelled out from the face of a wall by means of projecting stones; a window projecting from the wall face of the building and supported on brackets or corbelling; it has generally two pillars and balustrade, cupola or pyramidal roof.

PADMAKOSA .. Lotus-petals; a popular feature of Mughal art used to crown their domes, below the *Kalasa* finial, to which it gives a beautiful rise.

PALMETTE .. A broad design having the overspread leaves resembling the palm; a highly conventionalized palm motif.

PANCH-RATNA .. Five jewelled formula of the ancient Hindus, comprising a central *sikhara* flanked on the four sides by four subsidiary *sikharas*.

PANEL .. A sunk or raised compartment in wall, ceiling or door.

PARAPET .. The portion of wall above the roof sometimes battlemented; a low wall around a roof or platform to prevent people falling over the edge.

PARTERRES .. Regular systematic divisions of a Mughal garden.

PAVEMENT .. A floor which has been paved with brick or stone.

PAVILION .. An ornamental building or an open summer house lightly constructed; it is generally pillared.

PEDESTAL .. The base supporting column, statue or obelisk.

PENDANT .. Overhanging member attached with the apex of the soffit of a ceiling; also with the brackets.

PENDENTIVE .. The term applied to the triangular curved overhanging surface by means of which a circular dome is supported over a square or polygonal compartment; in the construction of a dome resting upon a square base the spherical triangle formed between each pair of supporting arches.

PHANSIGHAR .. Private execution chamber of the Mughals generally situated in the subterranean area.

PHASE OF TRANSITION .. The stage when the square room is converted into an octagon (and the octagon into 16-gon) to allow the circular dome to rest over it; the intermediary stage between the room below and the dome above; it is achieved by squinches or pendentives.

PIER .. (Latin '*petra*' = rock); a mass of masonry, as distinct from a column, from which an arch springs in an arcade or bridge; an independent solid mass of stone brick or concrete which supports a vertical load or the thrust of an arch.

PIETRA DURA .. Florentine mosaic; an ornamental mosaic of lapis-lazuli marble highly polished.

PIGMENTS .. Colours or other materials used as colours in an architectural painting.

PILASTER .. An attached pillar or turret for support as well as for effect.

PILLAR .. (Latin '*pila*'); a slender vertical structural member bearing a load; whereas a pillar may be square, oblong, polygonal, or circular in section, a column is always circular.

PINNACLE .. A small turret-like ornamental termination on the top of pilasters, buttresses, parapets or elsewhere, often ornamented with bunches of foliage or lotus flower and *kalasa* finial.

PLAN .. The representation of the shape of a building showing the general distribution of its parts on the ground.

PLINTH .. Projecting stepped or moulded base of any building; the platform over which the building stands; the square or moulded projecting member at the base of a wall or column.

POLYCHROME .. Ornamentation with many colours.

PORCH .. A structure sheltering the entrance to a building.

PORTAL .. The central arched entrance to a building.

PORTICO .. A colonnaded space forming an entrance or vestibule with a roof supported on at least one side by columns.

PULPIT .. *Minbar*; a raised stepped structure from which a sermon is preached or the *muezzin* leads the congregation; generally with three steps.

PUR .. Manual system of drawing water from a well through a rope and bucket (or skin-enclosure) pulled by bullocks on a ramp attached to the wall.

QIBLA .. The direction of Mecca indicated by the *mihrab* in a mosque.

QUADRANGLE .. Quadruple; a square or rectangular (oblong) courtyard enclosed on all sides by buildings occasionally with one side left open; it is generally open to sky.

QUOIN .. (French '*coin*' = angle); a term applied to corner stones at the angles of buildings and hence to the angle itself; external angles of a building.

RADIATING ARCH .. True arch which has regular voussoirs and allows the load to rest vertically, as against the trabeate system wherein the load rests horizontally.

RAMP .. A slope or inclined plane connecting two levels.

RAMPART .. In fortifications a defensive bank of earth with or without a stone parapet.

RAUZA .. Roza; a tomb in an enclosure; a mausoleum with all its necessary accessories.

RECEDING PLANES .. The zones generally of an arch which uniformly recede exteriorly.

RECTANGULAR .. Four-sided.

REHANT .. Mechanical system of drawing water from a well through a water-wheel which generally has 80 to 90 buckets or pots, rotating inside the well filling water from below and emptying it above in a trough connected with the channel. This is also worked by bullocks though on a regular level.

RELIEF .. Any ornamentation which relieves the monotony of the plain surface.

RELIEVING ARCH .. A brick or stone arch usually concealed, built over a lintel across an opening in order to relieve it of some of the superincumbent weight of brick or stone walling above it.

RIB .. A projecting band on a ceiling, vault or elsewhere; generally stone arches on the groins or surface of a vault which carry the thin web of the vault as the ribs of an umbrella support the thin fabric when stretched.

RIBS-AND-PANEL .. System of roofing in which space between two upward rising ribs is filled in by panels to form a ceiling.

ROSETTE .. Any conventional ornament carved or modelled to resemble a rose.

RUBBLE MASONRY .. Walling composed of rough stones which have not been dressed with hammer or chisel; unhewn and unfinished stone.

SANCTUARY .. The sacred part of the mosque; the main building of the mosque with nave, *mihrab*, pulpit, and domes.

SARACENS .. Arab invaders of the countries around the Mediterranean, i.e., Syria, Egypt, Algeria, Morocco, Spain, etc.; the word 'Saracenic' is a misnomer in India; Islamic inspirations in the medieval period must instead be identified as Turkish or Persian.

SARCOPHAGUS .. Tombstone.

SARVATOBHADRA .. The Hindu temple having a square plan, with *mandapas* on the four sides, having a central *sikhara* over the sanctum and four subsidiary *sikharas*. This was generally built on a raised, broad, square terrace.

SCREEN .. A partition or enclosure of iron, stone or wood often carved.

SCROLL MOULDING .. A kind of moulding so called from its resemblance to a scroll of paper, the end of which projects over the other part.

SEGMENTAL ARCH .. An arch of which the contour is a segment of a circle but less than a semi-circle.

SEPULCHRE .. A funerary structure, tomb or mausoleum.

SEPULCHRAL .. Funereal.

SGRIFFITO .. Incised painting; incised painting developed indigenously under the Mughals; in this a thick layer of colour pigment is laid over the white plaster surface; a design is then drawn over it and the colour is scraped off according to this design exposing the white plaster only according to the scraped off design.

SHAFT .. The portion of a column between base and capital.

SHAH-BURJ .. See *Ghusal-Khana*.

SHRINE .. A sacred place or object, e.g., a receptacle for relics.

SIKHARA .. Spire-like superstructure of the Hindu temple, rectilinear or curvilinear, having pyramidal appearance culminating in the *amalaka* and the *kalasa*-finial.

SOFFIT .. The ceiling or underside of any architectual member, the underside of a cornice, lintel, arch or dome; generally a vaulted ceiling of a dome or *chhatri*; the cup-shaped ceiling.

SPAN .. The distance between the supports of an arch, roof or beam.

SPANDREL .. The triangular space enclosed by the curve of an arch, a vertical line from its springing and a horizontal line through its apex.

SPIKE .. A rod of iron or wood, used vertically to crown the typically Islamic domes.

SPIRAL .. Rotating member (ramp or a staircase) round the circular shaft of a structure which helps ascending and descending.

SQUINCH ARCHES .. Arches placed diagonally at the internal angles of the square room in the phase of transition to convert it from the square to octogon to support the circular dome.

STALACTITE .. (Greek *'stalactos'* = a dripping stone): honey-combing; a type of ornament resembling the formation of calcium carbonate hanging from the roof of walls of a cavern; it appears to have originated in the multiplication of small squinch arches on a pendentive (hence the stalactite pendentive); its complicated arrangement of prisms appeared to the Arab love of geometrical decoration stimulated by the Islamic prohibition of animal representation; a typically Islamic feature.

STRING COURSE .. A moulding or projecting course running horizontally along the face of a building.

STRUCTURE .. A building; the frame work or fabric of a building as opposed to its ornamental features.

STRUT .. A slanting or serpentine bracket; bracket with delicate curves and volutes; a typical feature of Gujarat architecture.

STUCCO .. A slow setting hydraulic lime plaster on walls and vaults as a ground for relief ornamentation or for fresco painting; an ornamentation in plaster.

STUCCO-LUSTRO .. Painting done with the help of hot iron tools overlaid with wax or other similar material and polished.

STUPA .. Tope; a commemorative or sepulchral hemispherical Buddhist monument containing the relics; a religious symbol.

STYLE .. A manner or mode or fashion of building or in any particular region and distinguished by certain characteristics of general design, construction and ornament.

TALA-CHHANDA .. The rhythm of the level; the proportionate disposal of the horizontal parts of a construction.

TAPER .. Determined slope in a structure (e.g. in a turret) along its elevational line; the diameter decreases as the structure rises.

TERRACE .. A raised level promenade, paved or covered with turf and usually with a balustrade; stage or open space on a storey.

TERRACED GARDEN .. A garden laid on different levels, generally in regular descending stages, allowing the water through the respective water-devices to flow from higher level to the lower, rhythmically.

TERRACOTTA .. Earth baked or burnt in moulds for use in building construction and decoration, e.g., in wall facings and architectural details.

TESSELAE .. (Tesserae). Uniform small cubes of marble or stone used in mosaic.

THRUST .. The downward and outward pressure or force exerted by a dome, vault, arch or other structural member upon its supporting walls or piers counteracted in some cases by buttresses; Mughals used thick massive abutements for this purpose.

TIER .. Originally one of a series of rows of seats on a slope, e.g., in a theatre; stages or terraces generally one over the other.

TOMB .. Funereal memorial. A sepulchral construction; mausoleum.

TRABEATED .. (Latin '*trabs*' = beams); the style of architecture in which the beam forms the constructive feature in contrast to the arcuated style in which the main openings are spanned by arches; the load rests horizontally; pillar bracket and beam are its distinctive characteristics.

TRACERY .. The ornamental pattern work in stone to fill up a window.

TRANSOME .. The horizontal divisions or cross-bars of windows; a horizontal bar of stone or wood across a mullioned window.

TREFOIL .. An arch with three cusps or leaves.

TUDOR ARCH .. A depressed four-centred arch.

TUGHRA-NAVIS .. Calligrapher.

TURRETS .. Small towers generally attached at the angles or quoins in Mughal buildings.

URDHVA-CHHANDA .. Rhythm of the elevation; the proportionate disposal of the vertical parts of a construction.

VASTU .. Architecture; *Vastu* of the ancient Hindus not only signified architecture but also included sculpture (*silpa*), painting (*chitra*), and other allied arts and crafts, though no doubt they all occupied a subordinate position.

VAULT .. An arched covering in stone or brick over any building; an arcuate ceiling or angle support used for spanning the space.

VERANDAH .. An oblong corridor open on at least one side, situated before a room or a set of rooms generally rotating the central apartment.

VESTIBULE .. An ante-room to a larger apartment of a building; an entrance hall to the crypt.

VOLUTE .. The scroll or spiral occurring in capitals or other features.

VOUSSOIRS .. The truncated wedge-shaped blocks forming the true arch.

WATER CHUTE .. *Chadar*. An ornamental slanting slab connecting a water-channel on an upper level with a small pond on a lower level, allowing the water to fall in sprays.

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